

# FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

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## Flight.

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## EDITORIAL COMMENT.

**A**T last the utterly impossible is to be achieved! After having for years been told by all sorts and conditions of men, and particularly the "Wait and See" party, that an Air Ministry was a counsel of perfection, excellent in theory, but impossible in practice, the new Government has been quick to make up its mind that such a Ministry is necessary to the proper conduct of the war!

No time has been lost by the Government in giving effect to its recent announcement that in future the care of our aerial interests "The Impossible at Last!" should be placed in the hands of a competent body, with competent powers to insist upon the carrying out of its policy.

The name of the new head of the Air Board will come as a surprise to most people. Lord Cowdray, who has been appointed to the Chairmanship—presumably this should be Presidentship—of the reorganised Board, is a man of outstanding business experience, and a great organiser. As Sir Weetman Pearson, senior partner in the great engineering firm which bears his name, he has been associated with some of the most noteworthy works of recent times. He will thus bring to his new duties experience probably unique in the business world and which cannot fail to be of capital value at the present juncture. From every point of view the appointment is an admirable one.

The bare official announcement of Lord Cowdray's appointment leaves us rather in the dark as to the exact composition of the Board itself, though it is fairly safe to assume that it will follow the lines indicated by the Home Secretary in his speech in the House a fortnight ago. As we understand it, the primary duty of the Board will be to co-ordinate the production of aircraft for the two fighting services. In future, all orders for machines for the Services will be transmitted from the Admiralty and the War Office to the Board, whose function it will be to place the necessary orders for construction and to see that the machines are delivered in the shortest possible time, consistent with efficiency. That, it is true, does not go as far as we have advocated, but it is a long step in advance, if only for the reason that it marks the end of that unhealthy competition in the market between the Services which has been productive of so much friction and such a marked falling off in all-round efficiency.

Mr. Percy Martin, managing director of the Daimler Co.—a born organiser for maximum output—has been put in charge of the production of engines for motor transport and for aeroplanes. The whole responsibility for the supply of engines for the Army and Navy, motor transport services for Naval and Army aircraft, "tanks," and for agricultural machinery, will be centralised under the control of Mr. Martin. The output in the factories will be specialised, and the best use made of our productive machinery.

The supply of aircraft will be placed in the hands of Mr. William Weir, of Glasgow, who has given valuable help to the Ministry of Munitions in other directions. The Royal Naval Air Service and the Royal Flying Corps will be represented on the reorganised Board, and Major Baird will continue to act as the Board's representative in the House of Commons.

It will be seen that there has been a real setting of the house in order—it is an AIR BOARD that has been evolved and not the travesty which existed under the late Government.

Before we leave the subject, it would be ungracious if we refrained from paying tribute to the work done by Lord Curzon and his colleagues of the late Board. They worked hard and well, and that they did not succeed in evolving order out of chaos was no fault of their own. They were hopelessly handicapped from the start by the faulty constitution of the Board itself and its lack of executive power. Lesser men than they would have given up the fight the moment they saw the utter futility of the task. Instead, they carried on, knowing that something had to be done,

fighting for the powers they knew to be essential. To them we owe in no small measure the new order of things.

♦ ♦ ♦

## The American Peace Note.

The intervention of the President of the United States in the affairs of the nations of Europe, has not exactly enhanced his reputation on this side of the Atlantic. Neither by the Entente Powers nor by the Germanic combination has his unwarranted attempt to accelerate the peace movement been welcomed. Why he should have thought that his move was likely to produce any other effect than it did is not easily to be understood, unless the theory will hold water that he was, at the time the Note was written, in possession of some secret information relative to the German attitude towards peace by negotiation. Unless there was some such underlying reason, then the Note can only be regarded as a serious diplomatic blunder, which was calculated to produce precisely the opposite effect to that intended. That is exactly what has happened, and we take leave to think that President Wilson's error has made the prospects of an early peace more remote than they were.

We fully appreciate the motives that led to the sending of the Note. The whole world is sick of war—the British Empire is just as sick of it as the rest. But what President Wilson seems to have overlooked is that there are some things which are infinitely worse than war—even war as it is waged in Christian Europe in this twentieth century. President Wilson knows exactly what it is we are fighting for. He comes of the same stock as ourselves, and should thus be able to appreciate and understand our ideals. He knows that we have not accomplished what we have set out to achieve, and he has been told in plain terms that until we have reached the goal there will be no slackening of effort—we, at least, are not too proud to fight for our ideals.

It is when President Wilson sets out to tell us the reasons that have prompted his intervention that we find him far from happy in his manner of expression. When he says that: "America's interests have been most seriously affected by the war," we find it difficult to understand him. Materially, the European war has been by far the best thing that ever happened for American interests. It has made the United States the wealthiest country in the world. Almost the whole of the world's gold is in American hands. America has captured a very large proportion of the trade of the world that before the war was done by the European nations. What, then, does the President mean when he speaks of injury to American interests? If he means that American prestige has suffered in the eyes of civilisation as a result of the dilettante policy of its Government, then we can understand him. But in any other direction it is the merest hypocrisy to talk about injury to interests.

The President has had his answer from both groups of belligerents, and that answer has been an emphatic refusal to entertain his suggestion for a peace conference. He has in effect been told that when his mediation is desired he will be asked for it. Let it be hoped that he will take the hint. The war is our affair, and that of our Allies. When we have consummated our aims, we shall be to the full as competent to make peace as we are to make war—and we neither desire, nor will we admit, the interference of anybody else in the making of it.

## Sir D. Haig and the Need for "Best" Machines.

In the lengthy despatch, published at the end of last week, in which Sir Douglas Haig reviews the story of the Somme battles, he pays a well-deserved tribute to the work of the Royal Flying Corps. It is not with that tribute that we are concerned at the moment. The work performed by our aviators at the Front has so often been the subject of eulogy from the High Command that there is really no need to emphasise it again. There is, however, a significant passage in the despatch, to which we would call attention. Sir Douglas says:

"Not only has the work of the Royal Flying Corps to be carried out in all weathers and under constant fire from the ground, but fighting in the air has now become a normal procedure, in order to maintain the mastery over the enemy's Air Service. In these fights the greatest skill and determination have been shown, and great success has attended the efforts of the Royal Flying Corps. I desire to point out, however, that the maintenance of mastery in the air, which is essential, entails a constant and liberal supply of the most up-to-date machines, without which even the most skilful pilots cannot succeed."

There is a world of pregnant meaning in the last sentence. It would be undesirable to speculate too deeply as to what the implication contained in these words really is. It is certainly possible to read into them the meaning that the "best" machines have not reached the Front in sufficient number, else why should the Commander-in-Chief "desire to point out"? The necessity ought surely to have passed beyond the stage of needing emphasis from him. His warning words, however, come almost as an inspired confirmation of certain remarks recently made in "FLIGHT," to which we would once again urgently direct attention. While we know and appreciate the efforts that have been made by those responsible for the equipment of the R.F.C., it would seem that there still remains much to be done before the future of our aerial supremacy can be said to have passed out of the realms of anxiety. The sooner the Air Ministry is constituted and gets down to serious work the better it will be.

♦ ♦ ♦

## Raiding the Enemy.

The closing days of the old year were remarkable for a series of important British raids on enemy positions and munitions works. Enemy camps were successfully bombed in Gallipoli; the great and highly important Chikaldar Bridge on the Baghdad Railway was attacked by seaplanes and destroyed; a great raid was carried out on the blast furnaces at Dillengen, in which over a ton of bombs were dropped on these necessary adjuncts to the making of munitions; and yet another aerial attack was made on Zeebrugge. Not at all a bad record when it is borne in mind that all these raids were additional to the ordinary work of our airmen on the various fronts.

The most important of these raids appears to have been that on the Chikaldar Bridge. It is stated in the official *communiqué* that this bridge was destroyed. If this is really so, then it means that an important link in the enemy's communications has been broken. Its effective destruction would cut off not only the Baghdad main line extension itself, but also the Syrian lines, from railway connection with Western Asia Minor, and with its centres of supply for the Turkish armies in the Caucasus, in Mesopotamia and in Palestine and Arabia. It is a really vital link, and its severance would be of the utmost importance in its influence on the Eastern campaigns.





THE ZEPPELIN MENACE.—Let there be light—controlled.

**The Co-ordination of Aviation.** On another page of this issue of "FLIGHT" will be found the full text of a most important announcement dealing with the relations of two of the bodies charged with the development of the interests of aviation. Under the new arrangement, as disclosed by this document, the scientific and manufacturing interests of the movement will progress hand in hand under auspices which cannot fail to work to the greatest benefit to the cause of aviation. Briefly, the agreement once more emphasises the Aeronautical Society—into which much more activity is to be infused—as the paramount scientific body, while the same position industrially is now assigned to the Society of British Aircraft Constructors. The joint work of these two bodies will be carried out by a Standing Committee consisting of equal numbers of the Council of the Aeronautical Society and of the Committee of Management of the Society of Constructors, the Joint Committee having power to invite representatives of Government Departments and other bodies to assist when desirable. Questions relating to scientific research will, naturally, be dealt with by the Aeronautical Society; industrial matters will be reserved to the Society of Constructors. In addition, Technical Committees are to be established by the Aeronautical Society on the recommendation of the Standing Committee when the formation of such committees is deemed necessary for purposes of research.

The new arrangement is altogether admirable both in principle and in practice. Aviation has progressed to such an extent since the beginning of the war, that it has now become a firmly-established part of the scientific and industrial life of the country. On both sides of the movement it has attained dimensions that make it essential that the house should be put in order to the end that all progress in the future should be properly co-ordinated in order that time should not be wasted in futilities. By the use of that word we mean to convey that all detached or misdirected effort must be futile, since it either leads nowhere at all or at the best must arrive at the desired end by devious paths. Only by the close association of both scientific and industrial research can development pursue its course by the easiest and shortest roads. For this reason we welcome the new order of things,



### The Chairman of the Air Board.

The following announcement was issued by the Press Bureau on Tuesday evening:—

"Baron Cowdray of Midhurst has been appointed Chairman of the Air Board. In accepting this office Lord Cowdray stipulates that he does so without salary."

### Other Air Board Officers.

At the same time it was unofficially announced that Mr. Percy Martin, managing director of the Daimler Co., has been appointed to take charge of the production of engines for motor transport and for aeroplanes, and that Mr. William Weir, of Glasgow, is to be in charge of the supply of aircraft. It is stated that the whole responsibility for the supply of engines for the Army and Navy motor transport services, for Naval and Army aircraft, "tanks," and for agricultural machinery will be under the control of Mr. Martin.

### Lord Sydenham and the Air Board.

It was announced on December 30th that Lord Sydenham had tendered his resignation as a member of the Air Board. Since Lord Curzon became a member of the War Cabinet Lord Sydenham has presided over the Board in his stead.

### Conserving Alcohol Supplies.

The requirements of alcohol in the production of munitions, for the transport and air services, and for other purposes directly connected with the war, are increasing to so

which is eloquent of promise for the future of the great movement of aviation in Great Britain.

The course which these two paramount bodies has taken is one that might with advantage be extended by making the arrangement a three-cornered one, and including the body which represents and controls the sporting and the development of the art side of the movement—the Royal Aero Club. There is no doubt in our mind that the sporting side of aviation will, in the post-war days, continue to exercise a very powerful influence on the progress and development of flying. It has done so in the past—in fact, it is not going beyond the strict and literal facts to say that had it not been for the sporting influence so skilfully nurtured in the past, both the science and the industry would have lagged far behind the progress that has been made. It was the wealthy sportsman who found the money for development in the early days of the movement, and who thus made it possible for the nucleus industry to take shape as we knew it before the war. When once again peace reigns over the earth, it will be the sportsman to whom the industry will have to look for a substantial measure of support, and from this point of view, if from no other, such a three-cornered arrangement as we suggest would appear desirable. There is ample precedent for it. It may be recalled that in 1909 an agreement was entered into between the Aero Club, as it then was, the Aeronautical Society and the now more or less moribund Aerial League. This agreement divided the aerial movement under three fundamental heads: sport, scientific investigation, and the influencing of public opinion in the development of aviation from the point of view of national defence. The agreement defined the separate spheres of the three parties, each being recognised as the paramount body in its own sphere. If now we substitute the industrial interest for the influencing of public opinion, merely for the purposes of the argument, there seems to be made out a very good case for the suggested arrangement. It may be argued that the Club is already the paramount organisation of the sporting side of the movement, as is the fact, but we prefer the concrete to the tacit in such matters as these. These three bodies thus in intimate association, should assure to the art and industry the fullest protection and help.



great an extent that the Minister of Munitions has appointed an Advisory Committee to consider the best means to be adopted for securing adequate supplies of alcohol to meet the demand for war purposes and the essential industrial trades. The Committee comprises the leading men in the trade, and consists of representatives of the large patent still or grain distilleries, the malt or pot still distilleries, the rectifiers, and the methylators. The Board of Agriculture, the Board of Customs and Excise, the Board of Trade, and the Ministry of Munitions have each a representative on the Committee. The Chairman of the Committee is Sir Frederic Nathan, Director of Propellant Supplies, and Mr. W. H. Rattenbury, Explosives Department of the Ministry of Munitions, 32, Old Queen Street, S.W., is the Secretary.

### More Overseas Aircraft.

In addition to four aeroplanes, New South Wales Nos. 5, 6, 7 and 8, presented through Mr. C. Alma Baker, the Overseas Club announces the following gifts to the Royal Flying Corps from overseas:—

The Anzac, £1,500, raised by general subscriptions from Australia and New Zealand; City of Adelaide, £2,250, presented by Mrs. Harry Bickford, Adelaide, S.A.; Nigeria, No. 3, £1,500, residents of Nigeria; Otago, New Zealand, £1,500, residents of the Otago District, N.Z.; Shanghai Race Club, No. 3, £1,500, Shanghai Race Club; Western Province of the Gold Coast, £1,500, residents of the Western Province of the Gold Coast.



## THE NEW ALBATROS SCOUTING BIPLANE.

IN our last issue we gave a few particulars of some of the more recent German aeroplanes, including the new Albatros scout, of which we are able, this week, to give an illustration. Until comparatively recently, the Germans have not paid any particular attention to the reduction of head resistance, the aim of their aeroplane designers having been more particularly directed along lines of stability, as witness the early Tauben and "Arrow" biplanes. While fighting adversaries who were, long before the outbreak of war, specialists, so to speak, in high-speed machines, the gentle Hun has evidently at last realised the utility,

as construction is concerned, the body is not a true *monocoque*, but has four main rails in the usual fashion, and that the stream-lining is effected by a super-structure. The nature of the latter is not quite clear, but it appears to be a metal cover, probably aluminium. A detail which was quite clear in the original photograph, but which has been obliterated in the reproduction, is the new fitting for the interplane struts.

Instead of the old familiar steel cup in which rests a ring forming the anchorage for the bracing wires, a much smaller fitting is employed, consisting,



A new Albatros Scout biplane captured from the Huns by the British.

on occasion, of a good pace, always coupled, of course, with other qualities such as climb and manœuvring power, and at any rate, in the machine illustrated, "Speed" appears to be the keynote of the design. The large powerful engine, the stream-line body, the small wings, and the reduction of struts to a minimum, all point towards it. In the case of the body, it will be noticed that the method of stream-lining has even been carried to the extent of a hemispherical nose-piece over the propeller boss—a refinement which is not normally met with in German machines. The lines near the tail plane give indication that as far

apparently, of an eye-bolt, with forked ends passing through the spar, the eye-bolt in the end of the strut fitting into the forked end of that in the spar. The Mercedes engine is almost totally covered in, the radiator, mounted above the engine, only just clearing the *fuselage* covering. The tail planes, it will be observed, are neatly joined to the body, the appearance being, in fact, that the body covering is run upwards to form the covering of the fin as well. The rudder is partly balanced, wholly on top of the body and some little distance ahead of the elevator, as mentioned in our brief description last week.

### On the Russian Front.

In a despatch written by Prof. Bernard Pares in the late summer, from somewhere in Russia, and published in the *Daily Telegraph* on December 29th, he says:—

"In this part aeroplane raids by the enemy are very frequent. One or two aircraft come almost every day. Sometimes they throw bombs with surprising accuracy, but I have not heard of a case in which this side of their activity has caused any serious military inconvenience. But several of the many Red Cross detachments have suffered. Some of the stretcher-bearers have been wounded; and one sister, whose head was very badly broken by a splinter, is making a difficult recovery. Another was killed."

### France and Germany's Bid for Supremacy.

Writing in the *Echo de Paris* with regard to the new organisation of Germany's air service, M. Marcel Hutin says:

"In view of the unquestionable increase in the number of their aeroplanes, to say nothing of their airships, we must make the greatest effort to double, or even treble, the number of our machines, so as to give our aviation department, whether as regards directing artillery, fire scouting, or bombing, the necessary strength to maintain our supremacy over the enemy."

### The Capture of El Arish.

Writing to the *Daily Telegraph* from El Arish on December 21st, and describing the capture of that place, Mr. W. T. Massey says:—

"The column was escorted by airmen, who were frequently 10,000 ft. up, and kept off the enemy machines, a precaution which the repeated, though ineffectual, bombing of the last few days made necessary. Our airmen from dawn to dusk not only patrolled to protect the column, but denied an opportunity to the enemy to reconnoitre."

## NEW YEAR HONOURS.

ALTHOUGH the full list of New Year Honours was not published on Monday, the Naval and Military lists which were published show that a number of honours have been awarded to members of the R.N.A.S. and R.F.C., as set out below. The half-year promotions in the R.N.A.S. are set out in their usual place under "British Air Services" on p. 19.

The King has been graciously pleased to give orders for the following appointment to the Most Honourable Order of the Bath:—

C.B.

Rear-Admiral CHARLES LIONEL VAUGHAN-LEE.

The King has been graciously pleased to give orders for the award of the Distinguished Service Cross to the following officer in recognition of his services:—

Flight-Lieut. ERNEST WILLIAM NORTON, R.N.A.S.—In recognition of his skill and gallantry in destroying a German kite balloon on October 20th, 1916, under severe anti-aircraft fire.

The following has been mentioned in despatches:—

Warrant Officer 2nd Grade R. H. MULLIN, R.N.A.S.

The King has been pleased to approve of the following rewards for distinguished service in the field, dated Jan. 1st, 1917:—

*To be Major-General.*

Maj. and Bt.-Col. (Temp. Major-General) H. M. TRENCHARD, C.B., D.S.O., A.D.C., R.Sc.Fus.

*To be Brevet Colonel.*

Lt.-Col. (Temp. Brig. Gen.) E. B. ASHMOKE, C.M.G., M.V.O., R.A.

*To be Brevet Lieut.-Colonels.*

Capt. and Bt.-Major (Temp. Brig.-Gen.) C. A. H. LONGCROFT, Welsh R.

Major C. C. Marindin, R.G.A.

Major (Temp. Brig.-Gen.) D. Le G. PITCHER, Indian Army.

Major (Temp. Brig.-Gen.) T. J. WEBB-BOWEN, Bedford R. and R.F.C.

*To be Brevet Majors.*

Capt. (Temp. Lt.-Col.) J. G. HEARSON, D.S.O., R.E., and R.F.C.

Capt. (Temp. Lt.-Col.) P. L. W. HERBERT, Notts. and Derby R. and R.F.C.

Capt. (Temp. Lt.-Col.) E. R. LUDLOW-HEWITT, M.C., R. Ir. Rif. and R.F.C.

*To be Honorary Capt.*

Qrmr. and Hon. Lieut. (Temp. Maj.) F. N. KIRBY, V.C., R.F.C.

*Distinguished Service Order.*

Lieut. (Temp. Major) E. J. BANNATYNE, Hrs. and R.F.C.

Major (Temp. Lt.-Col.) J. N. W. BECKE, Notts. and Derby R. and R.F.C.

Major A. B. BURDETT, Yorks. and Lancs. and R.F.C.

Capt. (Temp. Major) T. A. E. CAIRNES, D. Gds. and R.F.C.

Capt. (Temp. Major) J. A. CHAMIER, Ind. Army. and R.F.C.

Temp. Major F. H. CLEAVER, Spec. List and R.F.C.

Major (Temp. Lt.-Col.) G. W. P. DAWES, R. Berks. R. and R.F.C.

Capt. (Temp. Lt.-Col.) R. C. DONALDSON-HUDSON, T.F. Res. and R.F.C.

Capt. (Temp. Lt.-Col.) A. HUGGINS, R.F.C., Spec. Res.

Capt. (Temp. Major) G. B. HYNES, R.A. and R.F.C.

Capt. (Temp. Lt.-Col.) P. B. JOUBERT DE LA FERTE, R.A. and R.F.C.



### Echo of a Zeppelin Raid.

TWELVE silver watches were, on Dec. 20th, presented to special constables of the district where the Zeppelin "L32" fell in flames, in recognition of their work on that occasion. Watches were also presented to Inspector Ellis and Police Constable Sparks, of the Essex Constabulary.

### The Year's Air Fighting.

IN a review of the aerial warfare during the year 1916, the *Guerre Aérienne* states that nearly 900 enemy aeroplanes were brought down, the French accounting for 450 and the British 250. Of 81 observation balloons brought down, 41 fell to the French and 27 to the British. Although the summary only goes from January 1st to December 20th, it is stated that when the figures for the last ten days of the year are added it will be found that in one year the Allies have carried out at least 750 bombardments, of which France was responsible for 250 and Great Britain for 180, to which must be added 174 which took place in Macedonia. The monthly

Capt. (Temp. Major) W. F. MACNEECE, R.W. Kent R. and R.F.C.

Capt. (Temp. Lt.-Col.) C. F. DE SALES MURPHY, M.C., R. Berks. R., and R.F.C.

Major SIDNEY SMITH, R.F.A., and R.F.C.

*Military Cross.*

Capt. (Temp. Major) R. G. CHERRY, R.F.A. and R.F.C.

Temp. Lieut. (Temp. Capt.) C. DANBY, Gen. List and R.F.C.

Temp. Major T. E. ST. C. DANNIELL, Gen. List and R.F.C.

Temp. Capt. J. O. DAVIS, R.F.C.

Qrmr. Hon. Lieut. and Temp. Major A. FLETCHER, R.F.C.

Temp. Capt. A. C. B. GEDDES, Gen. List and R.F.C.

Capt. N. J. GILL, R.A. and R.F.C.

Temp. 2nd Lieut. (Temp. Lieut.) G. W. M. GREEN, R.F.C.

Capt. R. R. DE C. GRUBB, Hrs. and R.F.C.

2nd Lieut. (Temp. Capt.) C. A. A. HIATT, Norf. R. and R.F.C.

Lieut. (Temp. Capt.) F. HUDSON, R.F.C. Spec. Res.

1717 Sergt.-Major C. N. KERNOT, R.F.C.

Capt. H. LE JEUNE, R.F.C. Spec. Res.

Capt. (Temp. Major) R. B. MARTYN, Wilts. R. and R.F.C.

Temp. Lieut. (Temp. Capt.) R. S. MAXWELL, Gen. List and R.F.C.

Qrmr. and Hon. Lieut. (Temp. Major) J. MEAD, R.F.C.

Capt. (Temp. Major) W. G. S. MITCHELL, High. L.I. and R.F.C.

Capt. A. H. MORTON, R.F.A. and R.F.C.

Lt. (Temp. Major) H. A. OXENHAM, Spec. Res. R.F.C.

Lt. E. W. J. PAYNE, Spec. Res. R.F.C.

2nd Lt. C. R. ROBBINS, R.A. and R.F.C.

Temp. Lt. (Temp. Capt.) P. G. ROSS-HUME, Gen. List and R.F.C.

Lieut. J. C. SLESSOR, R.F.C. Spec. Res.

2nd Lieut. (Temp. Capt.) B. E. SUTTON, Yeo. and R.F.C.

Qrmr. and Hon. Lieut. W. THOMAS, R.F.C.

Temp. Capt. N. W. WEBB, R.F.C.

2nd Lieut. (Temp. Capt.) J. T. WHITAKER, A.S.C. and R.F.C.

*Distinguished Conduct Medal.*

333 A.-S.-M. R. A. BAUGHAN, R.F.C.

1336 Sergt. D. R. BAXTER, R.F.C.

241 A.-S.-M. L. E. CARTER, R.F.C.

891 A.-S.-M. F. ELDRIDGE, R.F.C.

723 Fl.-Sergt. H. A. GAMON, R.F.C.

54 A.-S.-M. J. C. JONES, R.F.C.

1739 A.-S.-M. C. MARLEY, R.F.C.

*Meritorious Service Medal.*

5011 Sergt. G. N. BICKNELL, R.F.C.

6217 Corpl. F. A. W. BRAINE, R.F.C.

2570 Sergt. J. C. COOPER, R.F.C.

6629 Corpl. (Act.-Sergt.) W. R. DANDY, R.F.C.

3810 Fl.-Sergt. C. W. DURMAN, R.F.C.

80 Sergt. (A.-S.-M.) E. FOWLES, R.F.C.

255 Sergt. (A.-S.-M.) W. C. HAYWARD, R.F.C.

3724 Sergt. N. A. HEMMING, R.F.C.

3892 Fl.-Sergt. H. I. HOOPER, R.F.C.

3682 1st A. Mech. J. HORTON, R.F.C.

1416 Fl.-Sergt. C. J. HOWARD, R.F.C.

209 A.-S.-M. L. H. METZ, R.F.C.

64 A.-S.-M. C. MULLEN, R.F.C.

7134 1st A. Mech. O. S. SINGLETON, R.F.C.

1498 Fl.-Sergt. E. F. SMITH, R.F.C.

3793 Sergt. H. B. STRINGER, R.F.C.

1428 Fl.-Sergt. R. J. TALLYN, R.F.C.

2639 Fl.-Sergt. L. Wardley, R.F.C.

7649 Sergt. F. A. WOODALL, R.F.C.

reports show that the rate of progress has been constant from January to the end of September, since which time the atmospheric conditions have compelled aviators to moderate their activity.

### Another Prominent German Pilot Killed.

It is reported from Berlin that Lieut. Leffers, upon whom the Kaiser had conferred the Order Pour le Merite for his aerial work, was killed in an aerial fight on the Western front on December 27th.

### German Aeroplane on a Dutch Roof.

ON December 28th a German aeroplane was obliged to descend at Nymegen owing to the motor catching fire, says the *Handelsblad*. The machine crashed on to the roof of a house, and the two occupants, one of whom was an officer wearing the Iron Cross of the first class, were injured. When they descended from their machine they were taken by soldiers to the officer commanding the garrison.



# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## New Club House.

THE address of the Club is now 3, Clifford Street, New Bond Street, W.

Owing to unavoidable delay in completing the structural alterations, the New Club premises will not be ready for occupation by the Members until **Monday, 15th January, 1917.**

## Suspension of Entrance Fees of New Service Members.

Until further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

## Annual Subscription.

In accordance with the resolution passed unanimously at the Special General Meeting of the Members held on the 27th July, 1916, the subscription to the Club for the year 1917 and thereafter will be £5 5s.

## Servants' Christmas Fund.

The Subscription List for this Fund is now open.

## THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, London, W.

## Subscriptions.

	£	s.	d.
Total subscriptions received to Dec. 19th, 1916	11,098	13	3
Staff and Workers of Gwynnes, Ltd. (Twenty-ninth contribution) .. .. .	8	16	11
C. L. Embiricos .. .. .	3	19	0

Total, January 2nd, 1917 .. .. . 11,111 9 2

B. STEVENSON, Assistant Secretary.  
3, Clifford Street, New Bond Street, W.



Plan showing position of New Club Building,  
3, Clifford Street, New Bond Street, W.,  
the opening of which has been postponed  
until **MONDAY, THE 15TH JANUARY,**  
1917.

## AMERICAN BIDS FOR SEAPLANES.

How American aircraft constructors have met the request for tenders for twin-engined seaplanes for the Aviation Section, Signal Corps, U.S.A., is of more than passing interest this side. The specifications asked for tenders to supply 4, 8, 12, 16, 32, 64, 80, 90, 112, 126, and 148 complete machines, a minimum speed of 45 m.p.h. being required, while the machines must be able to rise from the water in 1,000 ft. Below we give a list of the tenders, the prices, which include engines, having been converted from dollars to £, on the assumption that £1 is equivalent to \$5. This may not be strictly accurate, but will be sufficiently so for our purpose. The figures for climb represent the altitude reached in 10 mins.

THE GALLAUDET Co.: 1 in 120 days; climb, 5,090 ft.; speed, 85 m.p.h.; four at £5,622 each; 32 at £5,160 each.

THE WRIGHT MARTIN AIRCRAFT CORPORATION: 1 in 150 days; 1 every 2 days thereafter; 12 at £5,900 each; 148 at £5,160 each.

THE COHEN MOTORS Co.: 2 in 85 days; 1 every 45 days thereafter; climb, 2,500 ft.; speed, 75 m.p.h.; 4 at £5,140 each; 80 at £4,630 each.

BENOIST AEROPLANE Co.: 1 in 70 days; 1 every 7 days

thereafter; climb, 3,200 ft.; speed, 65 m.p.h. Four at £2,960 each; 90 at £2,660 each.

NEW YORK AERO CORPORATION: 1 in 90 days; 1 every 14 days thereafter; climb, 2,600 ft.; speed, 75 m.p.h. Four at £4,800 each; 148 at £4,000 each.

BUFFALO AERO CORPORATION: 2 in 90 days; 1 every 15 days thereafter; climb, 6,500 ft.; speed, 90 m.p.h. Four at £3,695 each; 80 at £2,904 each.

THE AEROMARINE ENGINEERING AND SALES Co.: 1 in 100 days; climb, 3,000 ft.; speed, 75 m.p.h. Four at £3,800 each; 16 at £3,600 each.

THE HEINRICH Co.: 1 in 70 days; 1 every 16 days thereafter; limb, 4,000 ft.; speed, 85 m.p.h. Four at £2,970 each; 16 at £2,575 each.

THE STANDARD AERO Co.: 1 in 65 days; 3 every 7 days thereafter; climb, 3,500 ft.; speed, 80 m.p.h. Four at £4,500 each; 148 at £4,000 each.

CURTISS AEROPLANE AND MOTOR CORPORATION: Climb, 2,000 ft.; speed, 65 m.p.h. Four or as many as desired at £4,500 each.

BURGESS Co.: Climb, 3,000 ft.; speed, 75 m.p.h. Four without engines at £2,400 each; 32 without engines at £2,200 each.

L. W. F. ENGINEERING Co.: 2 in 120 days; 1 every 7 days thereafter; climb, 4,000 ft.; speed, 75 m.p.h.; 8 at £4,500 each; 32 at £3,800 each.

# Armchair Reflections.

by the "Dreamer"

ALLOWING that there are amateur gardeners who till the soil for pleasure, and amateur authors who write books for pleasure, in the vast majority of cases the work is done with one and the same object in view,

## Amateur Gardeners



to make money; therefore, I will not say of any book that I cannot understand why it was ever written.

Publishers, presumably, issue works with the same worthy object in view, and so long as the book is a seller, have nothing much to grumble about. Readers also please themselves what they buy, and what they pass over; therefore, in the ordinary course of things everybody should be satisfied. When, how-

ever, it comes to books on any particular science or art, the matter assumes different proportions, and people interested in any particular branch, and having that branch very much to heart, are apt to feel rather annoyed when works are published that set out to instruct, and do so in an ambiguous manner, or in a manner altogether wrong.

In my humble opinion the science of aviation would have suffered no great loss had the latest addition to aviatic literature, "Aircraft," by an "Air Pilot," never been published. Besides the "Author's Note," there is also an introduction by Mr. W. Joynson-Hicks, M.P., who very wisely disassociates himself from any responsibility for the correctness of the author's technical details. I have read through the work several times with interest and amusement, so that if this was the result to be obtained that was in the mind of the author when writing, his object should be most certainly attained. For the rest, it simply teems with contradictions and inexactitudes, to say nothing of absolute errors.

Engaged myself in the business of trying to evolve bread and butter *via* the end of a pen, I am inclined to look with admiration, even unto enviousness, at the works of some, and with leniency at the efforts of the "budders," for failing "buds" there would be no "blooms." As a literary effort, the book is disjointed, contradictory, jumpy, bad in construction and often involved in its phrasing. From the point of view of technical details, it contains many mistakes. It would have been the better for severe editing. In the opening four lines one gets straight up against a snag, for the author says, "In certain circles there exists a mistaken and prevalent idea that the history of aviation is confined to the late nineteenth and twentieth centuries." In his preface he says that his endeavour amongst other things is to "impress upon the public mind that the birth of aviation is the most important and far-reaching epoch

of our generation." And on page 21, "— 1900 may be said to date the birth of aviation." On the same page he says that the "base and vile uses" to which the Zeppelin has been put, debars the name of Zeppelin and his work "from all Christian discussion," and presently follows with two entire chapters on that very subject.

On page 70, he says, speaking of speed, "— and the fastest Zeppelin is a long way behind in this matter, when compared with the best aeroplane." Page 120 twists this about by saying, "But this difficulty the Germans have overcome by constructing the latest Zeppelins on the 'Spitzender'—a sharp point at both ends—shape."

Some of the other gems contained therein, and which ought to be highly instructive to all interested in aviation, are: "— to a great extent the size of the wings influences the speed of the craft, and the larger the wing spread, the greater the speed will be." "The warped portion of the wing is known as the ailerons." "The movements of the control-stick are very natural; by pushing it forward the machine rises; *per contra*, by pulling it backwards it changes the direction downwards." The following, in spite of the Defence of the Realm Act: "The principal engines in use in this country are the Gnome, Avro, Blackburn, Anzani, Clerguet (*sic*) Green, Sturtevant, and certain others which it is not desirable to mention at the moment."

Here is a peach, with reference to an engine: "— and provided it continues to give the requisite speed, will go on running for years." The three

## "Choppy" Clouds



qualities most required in building up an aeroplane or aircraft are given as, "Care in the manufacture of parts. Factor of Safety, and Resistance." This next paragraph I do not pretend to be able to unravel: "Flying over shell-fire has proved that the aeroplane is a much

more stable craft than we were previously given to understand. This latter is easily accounted for with regard to our own machines by the fact that the proportion of safety is inordinately great—being eight to one, whereas that of our allies is only four." All parts of an aeroplane should fit into their component parts "like a vice in a groove." And, speaking of the men (as apart from the officers) carried by a Zeppelin: "The latter are immaterial, they are but pawns in the game that oil the engines," &c. That Factor of Safety seems to worry the author no end, for in detailing the duties of a pilot, he says: "The pilot is concerned principally with the flying of the aeroplane, the care of the engine, spare parts, . . . He is held responsible for the general condition of the machine, also to see that it has a requisite factor of safety." "Once in a cloud, an aeroplane behaves much in the same way as a ship on a stormy



sea." This beats one of our own London Particular fogs, which are not quite so substantial as all that.

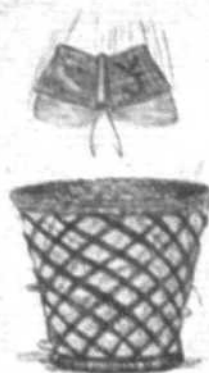
Well, I won't labour the point beyond saying the book is most interesting as an example of how not to do it, and when I write my first book on aviation; I hope I shall be as fortunate as the author of "Aircraft" in finding a publisher, and not so unfortunate as he, in producing a humorous work when one of an entirely different type was intended.

By way of a "final" gem, how is the following? "A cricket ball thrown into the air could, by reason of its own momentum, continue on for ever, were it

not for the resistance of the air, which soon brings it dropping to the ground.

"This same condition applies to the aeroplane, and more so."

If gravitation was inoperative in the theory of the author's cricket ball, it was very much in evidence with regard to his volume on its way to the W.P.B.; it fell like a ball—and more so.



## ANSWERS TO CORRESPONDENTS

**B. P.** (New Southgate).

Your question is not quite clear. You state that the weight of the machine is 1,500 lbs. and the area 300. Obviously, therefore, the lift must be 5 lbs. per square foot at any speed if the machine is to proceed on a horizontal flight path, i.e., neither ascending nor descending. We take it that what you really want to know is what lift coefficient will be necessary for such a machine to fly at the speed mentioned of 40 m.p.h. Since lift per square foot =  $C \times 0.0051 \times V^2$ , where  $C$  is the lift coefficient, and  $V$  is the speed in m.p.h., the required value of  $C$  is obviously:  $C = \frac{\text{lift per sq. ft.}}{0.0051 V^2}$

$= \frac{5}{0.0051 \times 40^2} = 0.6$  approx. In a modern wing section such a lift coefficient is quite possible, but scarcely at an angle of incidence of 2 degrees; more probably at about 12 or 14 degrees. The lift at any other speed can be found by substituting other values for  $V$  in the equation.

**A. H. C.** (Golders Green).

The weight complete of a 50 h.p. Gnome is about 170 lbs. Petrol consumption about 5 gallons per hour and oil consumption about 1 gallon per hour. The weight of a suitable mounting and cowl would probably be approximately 50 lbs. and the propeller for it would weigh about 20 lbs.

**E. E. H.** (Kettering).

We have heard of no recent experiments with Hertzian waves as utilised for counteracting the force of gravity. You might obtain some information on the subject from the editor of *The Wireless World*, Marconi House, Strand.

**C. A. D. W.** (Maidenhead).

You had better wait for a few months and then apply for a commission in the R.N.A.S. In the meantime you should study the subject as much as possible.

**J. F.** (Wakefield).

You had better inquire of Major Mitchell, The Polytechnic, Regent Street, London, W., who is the recruiting officer for the R.F.C., as to whether there are any vacancies in your trade at present. Thanks for the photograph of your model, which we will use shortly.

**E. J. S.** (Tidworth).

Those who meet with accidents are not entitled to wear the gold stripe. You might be entitled to gratuity, but it is impossible to say without knowing the details.

**A. L. G.** (Ripon).

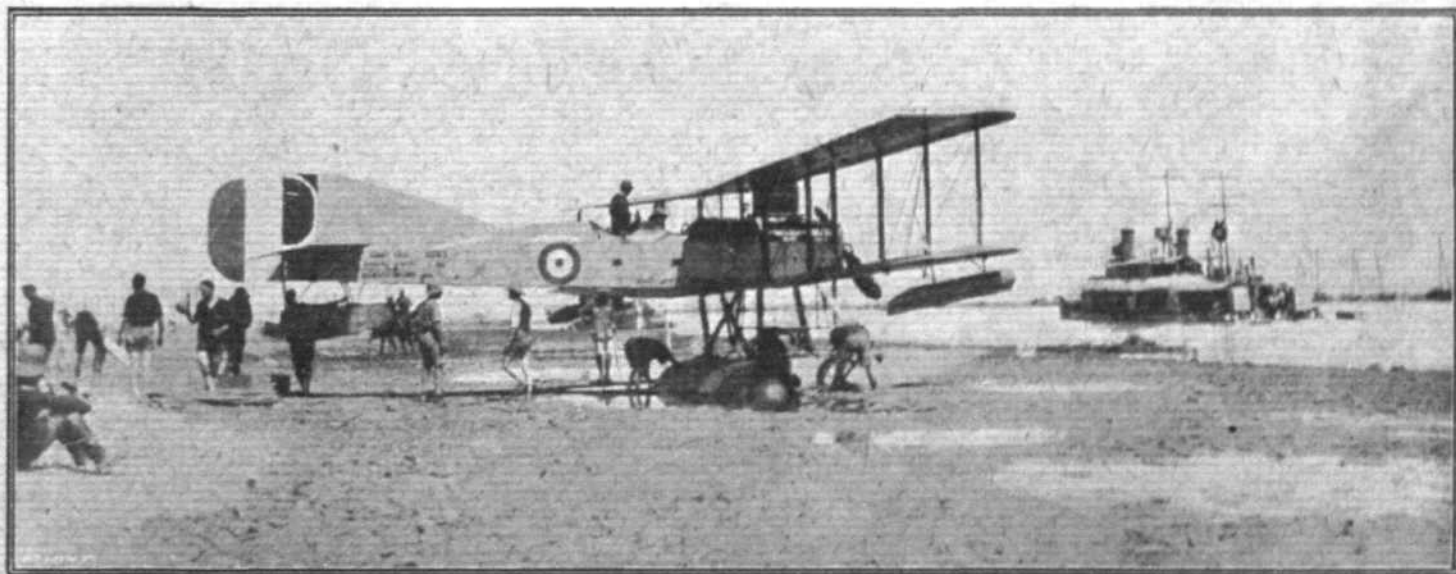
The manuals you mention are for official use only, and are not on sale to the general public.

**J. J.** (Croydon).

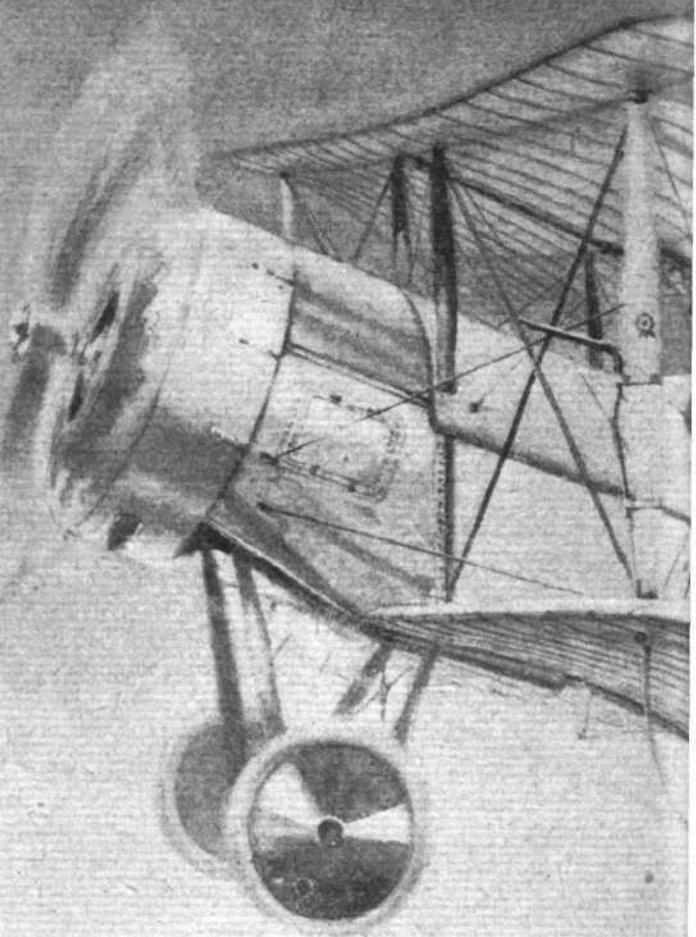
Your age would almost certainly debar you from obtaining a commission in the R.F.C., and it is doubtful whether you would be accepted as a mechanic. You should write to Major Mitchell, The Polytechnic, Regent Street, London, W.

**R. H.** (Leicester).

Apply to Adastral House, London, E.C., for the necessary form, and having filled it up send it in. There are no fees. If accepted you would be sent to one of the flying schools for training. It is impossible to say how long the training would take.



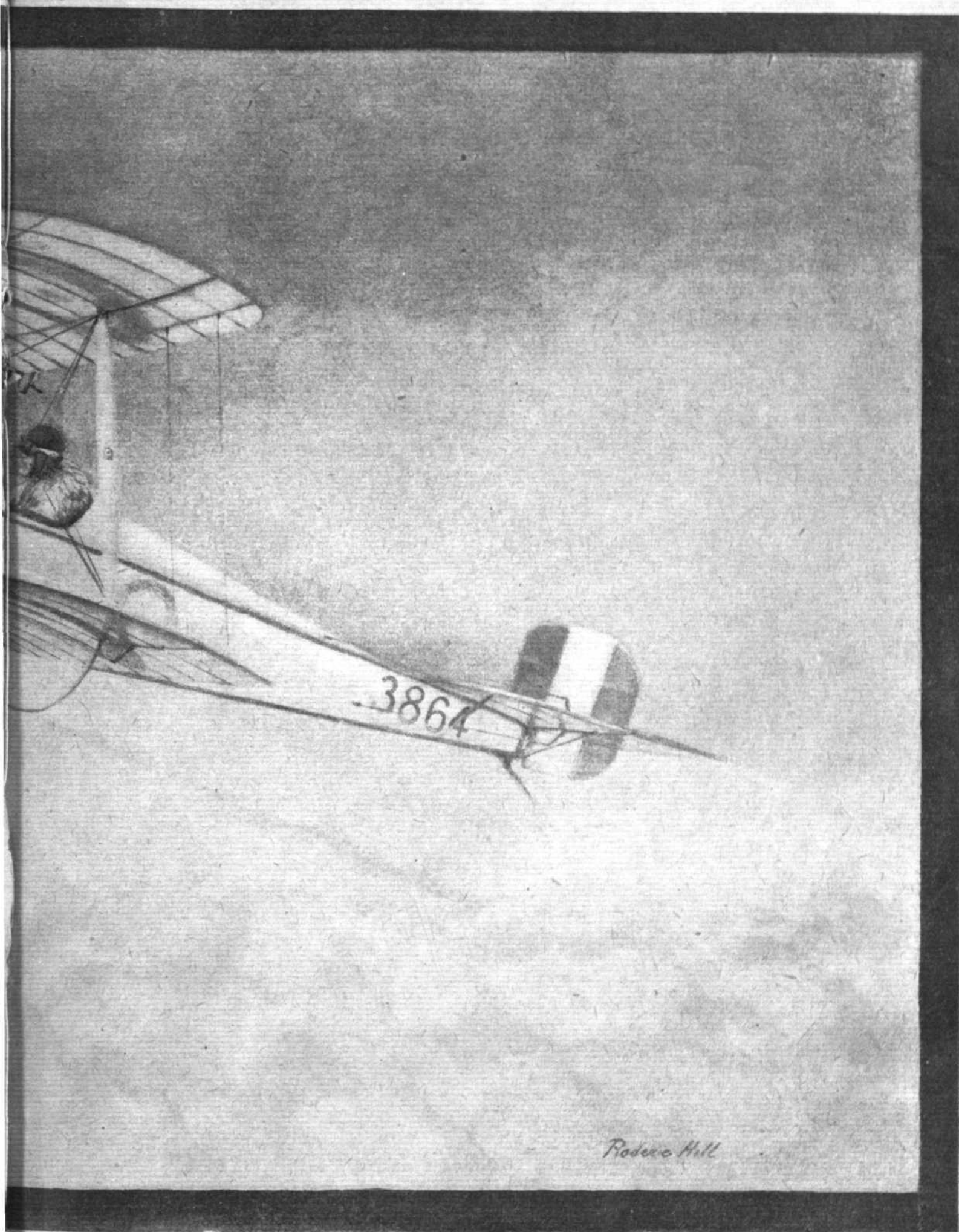
THE BRITISH FORCES IN MESOPOTAMIA.—A seaplane base with its Monitor guards.



FLIGHT

GETTING HER HEIGHT.—The Bristol Scout





mbing. (From an original drawing by Roderic Hill.)

# AIRISMS FROM THE FOUR WINDS.

OUR aeroplanes are the eyes of the Army, whereas formerly, they were only considered as spectacles.—*Whipped Topics.*

WITH Lord Curzon a member of the War Cabinet, and Lord Sydenham's resignation in, as a member of the Air Board, but little substance is left to distribute. All the easier for the Air Minister to get going right away. It is to be hoped, for obvious reasons, that the gratuitous suggestion of the *Daily Mail* towards fresh complications by advising the construction of service machines by the Services will be appreciated at its proper value. It would truly be a case of out of the frying-pan into the fire.

Is it ——— or ——— ?

No, certainly not the "or," whose press agent must have allowed his advocacy to outstrip his discretion in some quarters last week.



The very original and quaint Christmas greeting card for 1916 which has been used by the Royal Flying Corps this year. The long deep shadows well carry out the idea of the aeroplanes being lined up ready to start in the early morning, with the sun just getting up behind the sheds. For those who may not recognise the work, the tiny hieroglyphics in the right-hand bottom corner represent the initials of Flight-Commander Roderic Hill, D.S.O., whose work is so well known to our readers.

NOT unexpected keen interest in the results of our air work is evinced by both King George and Queen Mary. One intensely practical form of this is in the very remarkable collection of aerial photographs secured in active aerial reconnaissance by the R.F.C. over the enemy's lines and the country occupied by him. A goodly selection of these was last week exhibited to their Majesties at Buckingham Palace, under the direction of Major C. D. M. Campbell, of the Directorate of Air Organisation.

THE United States are making a big bid to make up for past slackness in air development, and no doubt by the time our little troubles this side are over, the home of the Wright Brothers will be well on the road to aeronautical efficiency. Not unnaturally, out there most attention is being given to the practical utilisation of the aeroplane, although even the United States Government is realising it is time they did something to put themselves into line with modern practice. Amongst the more promising commercial suggestions is one that regular air mail services between New York and Chicago should be instituted. In this connection it may be worth noting that it is estimated that the average time for the flight of 720 miles would be seven hours. The fastest train takes more than 20 hours to cover the distance between the two cities.

MR. CHARLES BRIGHT, a member of the recent Air Enquiry Committee, was intensely keen in regard to all practical matters which concerned that Enquiry, and he probably took more trouble to become thoroughly versed in the why and the wherefore of aerial navigation than all the rest of this Judicial Committee put together. It is refreshing to have from Mr. Bright his views as to folk being "too old at 40" to take to the air. In quoting the late Lord Lucas, who lost his life in the air, by way of his text, Mr. Bright states the fact that he himself has "taken to the air," as a passenger, when over 50 years, and from his personal experience "would strongly recommend flying to more or less elderly people for its recuperative effects and as a capital antidote to insomnia. Permit me also to commend it to members of the Parliamentary Air Committee and others interesting themselves in aviation. One learns more about aviation by personal experience in the air than can be learnt in any other way. Indeed, I would not now venture on a pronounced opinion on some much-disputed points unless I had satisfied myself by direct personal investigation. Looking ahead to the days when international intercourse by air will be far more common than it is at present, there seems no reason why elderly aerial special constables should not act as coast patrols. Those of doubtful age should, in actual fact, be even more ready to risk their lives than young fellows with everything before them; and I cannot help thinking that an opening should be made for the older type of airmen as instructors and patrols, especially in view of the shortage of the former."

THE venue of Lady Drogheda's aeronautical "Picture Show" has now been definitely settled. It is at the Grosvenor Gallery, where the valuable and big collection of pictures and photographs, ancient and modern, including a supremely interesting selection of aerial reconnaissance photographs from the front, will be displayed. January 8th is the "hanging" day, and it is hoped to be ready for the public by about the 12th. It should be one of the most attractive exhibitions in London while it lasts, and afford an opportunity to the public to become conversant with the "art" of aviation without having to rise from *terra firma*. Moreover, by way of reminder, the entire proceeds will go to swell the funds of the Royal Flying Services Fund and other worthy objects which are dear to the heart of Lady Drogheda. Our advice is: Do not miss a visit to this unique display.

MR. LLOYD GEORGE has expressed his appreciation of the efforts of the Overseas Club, which have already resulted in over 80 aeroplanes being presented to the R.F.C., and hopes, moreover, that their "ambition of an Imperial Air Fleet of 100 units will be realised." Which it will, judging by the



enthusiastic work which has so far carried the Club to success.

BE the plots and situations in up-to-date and future works of fiction ever so weird and uncanny, apparently, it will be a bold critic who will dare to "call" the author. In the award of honours stories there are sufficient facts to found a thousand chapters in as many novels. Yet official language is not as a rule classed as leaning toward the unduly sensational side. Perhaps one of the most remarkable "incidents" so far recorded is to be found in a letter of the late Captain Bölcke, the famous German pilot, which is published in the book of his Field Reports in Germany. In describing a fight between German and English air squadrons near B—, on September 27th, he says:—"My antagonist tried to get away, but I stuck to him (apparently firing all the time at point-blank range). But I couldn't help admiring his endurance. I must have settled him long ago, but round and round he kept on flying as well as ever. It was too much to stomach. I said to myself, 'The fellow's dead long ago, but the plane keeps on the level because he's got rubber bands keeping the steering-gear right.' So I flew close in and there I saw the Englishman slightly toppled over to the side sitting at his wheel stone dead."

THE number of the machine, as noted by Bölcke, was 7495.

NOTHING like a variation in mount occasionally for a good jockey. Hence the joining up to the R.F.C. of Joe Childs, the highly successful jockey in England last season, is to be welcomed. We wish him well in his desire to ride the wind as a change to his favourite haymobile practice.

In the New Year's Honours list, amongst those who have more than deserved their inclusion, is Major-General Trenchard, the Commander of the R.F.C. His portion of the unparalleled work of our C.Os. at the front has still to be recorded. It should make glorious history to be attached to the development of aviation.

WHAT will he do with it? That's the question which crosses the mind of most of us when we remember that Lord Michelham is anxious to present a couple out of the ten £1,000 prizes which he so generously offered to airmen who destroyed Zepps. on this side of the "German" Ocean; but he mustn't, according to Service etiquette. We do not in the least quarrel with the Army regulation, which, in discouraging civil rewards for deeds performed in the ordinary course of duty, has but the attaining of the highest individual efficiency in mind. In this instance it is perhaps a bit rough on the two D.S.Os. who were just too late to get outside the new regulations. But the question still remains, what will Lord Michelham do with the beastly £10,000 which he, no doubt in his own mind, now holds but as a trustee for somebody. We would suggest that he might easily find a way out of his quandary and do a really noble action at the same time. Add that goodly sum to the Royal Flying Services Fund, which has the highest official support and is entirely administered by the Royal Aero Club, free of all working expenses, for the benefit of officers and men of the Flying Services, who are incapacitated on active service, and for the widows and dependants of those who are killed.

MAY this suggestion commend itself to Lord Michelham, and we feel sure no one would more heartily applaud such an outcome of the original offer than 2nd Lieutenant Sowrey, D.S.O., and 2nd Lieut. W. J. Tempest, D.S.O. In a way

the original object could still be attained by associating with the gift the deeds of the two D.S.Os. in question. It would be a gratification to them for all time to know that through their efforts they had been the means of directly benefiting brother aviators or their kin, who had been less fortunate than themselves. A little informal "presentation" function at the new House of the Royal Aero Club in Clifford Street might be an appropriate final setting to this magnificent effort, for the moment without a resting place.

WHAT'S the verdict, Lord Michelham?

A CHANCE offers to obtain souvenirs, or relics, or what you will, of past doings at the R.A.F. by seekers after such historical trifles. Tenders are to be invited at an early date by Messrs. Horne and Co., of 85, Gresham Street, E.C., for "a quantity of obsolete aircraft fittings and parts of aeroplanes, &c.," from the Royal Aircraft Factory. There's a wealth of possibilities in that "&c."!

#### TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT's" precursor and sister journal) of January, 1907. "FLIGHT" was founded in 1908.

#### COUNT DE LA VAULX'S EXPERIMENTS.

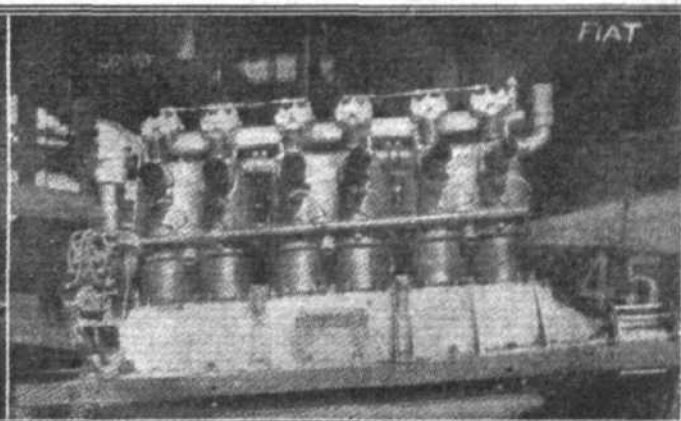
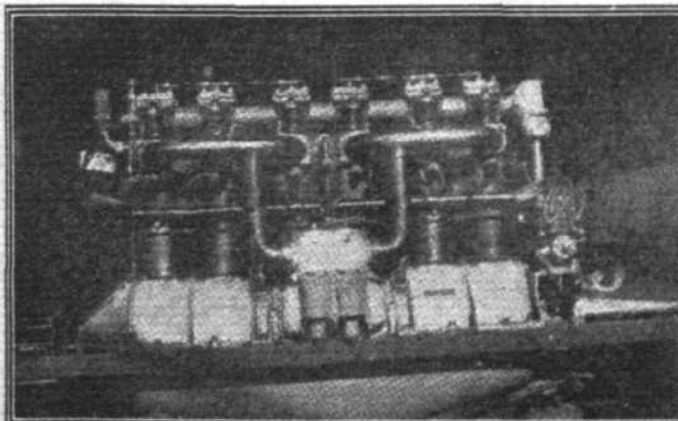
Count de la Vaulx went out with his airship for practically the first time on Christmas Day. It was only a trial ascent for the purpose of testing various parts of the machine, and only some three-quarters of an hour was spent in evolutions at the end of the guide-rope. On the 28th he again went out at Sartrouville from M. Deutsch's shed, and at about 4 o'clock the airship was taken out on to the Montesson Plain. Some men who were holding the guide-rope after the propeller was already revolving at high speed caused the airship to cannon against the ground, the surface of which was frozen so hard that two of the tubes of the car were broken. These tubes were repaired, and on the following day Count de la Vaulx went out again, but the cold was too severe for any extended operations.

#### AN ITALIAN NAVIGABLE BALLOON.

Signor Raffaele Ronco, a young Genoese musician, seems to be a universal genius, as he has not only composed an opera, but has invented an airship as well, of the navigable balloon type, which it is said proves itself to possess very remarkable qualities in the case of experiments recently carried out at the military grounds at Genoa. Signor Ronco is understood to have made inventions relating to submarines which are regarded as of great value by the Italian Admiralty.

#### TESTS OF THE VUIA AEROPLANE.

M. Vuia has introduced several improvements in his aeroplane, notably a new propeller, the diameter of which is 1.80 mm. It weighs only 5 kilogs., as compared with nearly 9 kilogs., the weight of its predecessor, and the pull it develops is said to be 12 per cent. more than the former one. The whole machine also weighs 9 kilogs. less than when the last experiments were made. . . . M. Vuia took the machine out one day last month at Bagatelle, and carried out two determined attempts at flight in the presence of M. Ernest Archdeacon, M. Georges Juchmes, the celebrated pilot of the Lebaudy airships, and others. At the first attempt the aeroplane did not develop sufficient speed along the ground to rise in the air, but on the second occasion at midday the machine moved very much better, getting up a good speed of some 40 kiloms. an hour, the wheels actually lifting about 1 ft. clean off the ground, and accomplishing a little flight, or rather jump, of some 6 metres.



The inlet and exhaust sides of the 100 h.p. Fiat aero engine, manufactured at Turin, which is extensively used in Italy.



UNDER the above heading will be published weekly particulars of a personal character relating to those who have fallen or have been wounded in the country's service, announcements of marriage and other items concerning members of the Flying Services and others well known in the world of aviation. We shall be pleased to receive for publication properly authenticated particulars suitable for this column.

### Casualties.

Second Lieutenant NOEL MITTFORD HENSON ATKINSON, East Lancashire Regiment, attached R.F.C., was killed on December 27th while serving in England, aged 25. His brother, Second Lieutenant Guy C. Renell Atkinson, East Lancashire Regiment, died on October 30th last of wounds received on October 24th. The younger and elder sons respectively of Dr. and Mrs. T. Renell Atkinson, of Chadwell Heath, Essex, they were educated at Chigwell School and enlisted in the U.P.S. Battalion, Royal Fusiliers, on the outbreak of war. They served in the trenches through last winter and were sent home last spring for commissions, which they obtained in the East Lancashire Regiment.

Lieutenant HERBERT BRERETON, R.F.C., was killed on December 21st, aged 22 years. He had been on active service for 19 months, and had formerly held a commission in the Liverpool Regiment. He was the only son of Mr. and Mrs. W. H. Brereton, of 24, Nottingham Place, W.

Second Lieutenant GEORGE DOUGLAS PECHELL, Indian Army Reserve of Officers, attached R.F.C. (killed while flying on December 21st), was younger son of Lieutenant-Colonel Sir A. Alexander Brooke-Pechell, Royal Hospital, Chelsea. He was gazetted to the Indian Army Reserve of Officers in November, 1914, and in the following January was attached to one of the Infantry regiments. Subsequently Lieutenant Pechell was attached to the Royal Flying Corps.

Captain ALAN JOHN MACDONALD PEMBERTON (Mac), M.C., Leinster Regiment, attached R.F.C., who was missing on November 3rd, and who is now reported to have been killed on that date, was the son of the late Major-General W. W. Pemberton, I.S.C. Born at Toronto in 1892, he was educated at Fairfield, Malvern Link, and at Repton (The Priory), and obtained a commission in the Leinster Regiment in 1911. He went out to France in December, 1914, and was present at the battles of St. Eloi and Ypres. He was mentioned in despatches, and was awarded the Military Cross. He joined the Royal Flying Corps last January, and went to the front in October.

Captain ALFRED SPENCER MASON SUMMERS, Hussars, attached R.F.C., who was reported missing on September 15th, and is now reported killed while attacking a hostile balloon, aged 30, was the only son of the late Mr. J. W. Summers, M.P., and Mrs. Summers, of Emral Hall, Worthenbury, North Wales. He was born in 1886, and educated at Eton and Trinity College, Cambridge, where he took a first in law. He joined the Montgomeryshire Yeomanry, and in 1909 was gazetted to the Cavalry (Hussars), going out to the front in August, 1914, as machine-gun officer, and being mentioned in despatches in May, 1915. In December, 1915, he was attached to the R.F.C., and went out to the front in the following May as a flight commander. He was married in July, 1914, and leaves a son.

Captain CECIL ROBERT TIDSWELL, Dragoons and R.F.C., killed, was in his 36th year, and was the only son of Mr. and Mrs. R. H. Tidswell, of Bosmere Hall, Needham Market, and Wilton Crescent. He entered the cavalry in September, 1901, was promoted in 1904, and had his captaincy in April, 1909, while he was gazetted Flight Commander in the R.F.C. in June of this year. Captain Tidswell saw service before the present war in South Africa, in 1902, and received the Queen's medal with five clasps.

Second Lieutenant BERNARD VERNON GORDON, R.F.C., who was accidentally killed while flying in England on December 14th, aged 18, was the youngest son of the late Thomas Gordon and Mrs. T. Gordon, of Eastbourne and Sevenoaks. He received his commission direct from Eastbourne College last July.

Lieutenant H. R. DEIGHTON SIMPSON, R.F.C., who was accidentally killed while flying in England on December 19th, aged 20 years, was the eldest son of Mr. and Mrs. Henry W. Simpson, of New York.

Second Lieutenant PERCY ANDREW WRIGHT, R.F.C. (died on December 21st from injuries received while flying the previous day), was 29 years of age and the son of Mr. J. P. Wright, of Fort Francis, Ontario. He obtained his commission in April last and was gazetted flying officer in the following July.

### Missing.

Second Lieutenant GEORGE H. BENTHAM, East Surrey Regiment and R.F.C., officially reported missing, is the eldest son of Mr. H. Bentham, of the Department of the Ministry of Munitions, Kirkliston Drive, Bloomfield, Belfast.

### Married and to be Married.

The marriage arranged between Captain A. R. STANLEY CLARKE, Dorset Regiment and R.F.C., and Miss BAKER will take place quietly at Almondsbury about the middle of January.

At Holy Trinity Church, Cambridge, Lieutenant CHARLES HURD HOWELL, R.F.C., was married to MARGARET, daughter of the late ex-Governor WILLIAM E. RUSSELL, of Cambridge, Massachusetts, and of Mrs. MICHAEL FOSTER, of Harrogate and San Remo.

Flight Lieutenant GRAHAM GOODENOUGH MCHARDY, R.N., younger son of Captain Hardy McHardy, R.N., Thornbury, East Liss, was married to FRANCES VALENCIA, only daughter of the late Colonel HARRY SHULDAM-LEGH, M.V.O., The Royal Irish Regiment, on December 20th at St. Mary's, The Boltons, S.W.

On December 16th, at St. Peter's Church, Cranley Gardens, Flight Commander J. H. LIDDERDALE, R.N., son of Dr. and Mrs. Lidderdale, of Prestbury, Gloucestershire, was married to MAUD, youngest daughter of Mr. and Mrs. J. HANSON WALKER, of 2, Queen's Elm Square, Chelsea, S.W.

The marriage of Lieutenant GUY MOON, R.E. (attached R.F.C.), son of Lieutenant and Mrs. Moon, of Weston-super-Mare, to DOROTHY, daughter of the late Rev. J. H. TWINING, formerly Vicar of Woodford, Salisbury, and Mrs. Twining, of St. Mary's, Derby Road, Bournemouth, took place on December 20th at St. Martin's Church, Ruislip, Middlesex.

The engagement is announced between Captain HAROLD E. REYNELL, Black Watch, attached R.F.C., eldest son of Mr. H. E. Reynell, of Kobe, Japan, and GEORGIANA CATHERINE, eldest daughter of Mr. and Mrs. JOHN LIDDELL, of Shanghai, China.

The marriage arranged between Lieutenant R. H. SPENCER, Royal Artillery and R.F.C., son of the Rev. R. E. Spencer, late vicar of Willington, Maidstone, and Mrs. Spencer, and MOLLY, younger daughter of Major J. W. H. THOMPSON, and Mrs. Thompson, of 2, Southwick Crescent, W., and Bratton House, Wincanton, will take place very quietly early in February.

A notable Anglo-Italian marriage is announced to take place early this month at Rome between Mr. CHARLES F. PIERCY, an Artillery officer serving with the R.F.C., and DONNA ORTENSIA DI MIGNANO, daughter of the Duchessa di Mignano and the late Duca, of Castel Mignano, Naples. Mr. Piercy is the son of Mr. Robert Piercy, of Marchiel Hall, Denbighshire, has Italian connections, and among his aunts are Lady (Buchanan) Jardine, Lady Elliot, and Mrs. Bell-Irving, of Rokeby.

### Items.

The will of the late Sir HIRAM STEVENS MAXIM, the "Chronic Inventor," as he once styled himself, of Sandhurst Lodge, High Road, Streatham, whose death took place on November 24th, aged 76 years, has been proved at the gross value of £33,090.



# FINAL REPORT OF THE COMMITTEE ON THE ADMINISTRATION AND COMMAND OF THE ROYAL FLYING CORPS.

(Continued from page 1147.)

## CHARGE NO. 2.—"TOO BLIND FAITH IN THE R.A.F."

36. The point is put as an argument thus: General Henderson, as Director-General of Military Aeronautics, is responsible for the R.A.F. It is to his credit if it does well, to his discredit if it does ill. It is only natural, therefore, that he should prefer the designs of the R.A.F., whether for aeroplanes or engines, to those of private manufacturers, and that he should give the R.A.F. facilities for designing aeroplanes by letting them have the best engines round which to design their aeroplanes, and refuse the same facilities to private firms.

The facts, say the critics, are in accordance with and support the argument, and they rely upon the following:—

There was delay in ordering better engines.

There was delay in ordering better aeroplanes.

The R.A.F.—Napier 200 h.p. engine was ordered in large quantities before it had passed its tests.

The better engines, when procured, were reserved for the R.A.F., and none were allotted to private firms.

37. Dealing with these allegations in order—The alleged delay in ordering better engines occurred in respect of the 110 h.p. Clerget, the 110 h.p. Le Rhone, and the 200 h.p. Hispano-Suiza engines.

All these engines are admittedly good, and all have now been ordered in considerable quantities.

38. There was, we think, no undue delay in ordering the 110 h.p. Clerget engine. There was very considerable delay in the case of the 110 h.p. Le Rhone engine, and slight delay in the case of the 200 h.p. Hispano-Suiza.

39. The delay in ordering aeroplanes is alleged to have occurred in the cases of the Bristol Scout, Nieuport and the Sopwith 1½ Strutter. We think there was no delay for which any blame can be attributed to the Royal Flying Corps in any of these cases.

40. We do not think that the delay in ordering the Le Rhone and the Hispano-Suiza engines was attributable to the fact that the Directorate was trusting to the R.A.F. to produce equivalent or better engines. The only engine of its own which the R.A.F. was engaged upon was the 140 h.p. R.A.F., which could not have taken the place of either the 110 h.p. Le Rhone or the 200 h.p. Hispano-Suiza.

41. We are, however, not so much concerned to see whether the rhetorical charge of "too blind faith" is made out as to see whether any blame attaches to the directorate for the delay and whether the Royal Flying Corps suffered from it.

42. In the case of the Hispano-Suiza engine, negotiations for its production were entered upon promptly and a draft agreement was sent to the company on November 3rd, 1915. The answer miscarried and the matter dropped until February 22nd, 1916, when the directorate reopened the negotiations and carried them without delay to a successful issue. We think the four months' delay ought not to have occurred, although in this case no real harm accrued. The Hispano-Suiza engine was originally one of 150 h.p. They were experimenting with one of 200 h.p. The latter was bought for the Royal Flying Corps, and this engine was not in a sufficiently advanced stage to have been procured earlier.

43. The history of the 110 Le Rhone engine is different. This engine was at first, and in 1915, procured through the French Government, but the French wanted it for themselves, and were unable to continue to supply the Royal Flying Corps. It is a difficult engine to build, and a builder had to be found. This took time. Another fact was that it was doubtful whether both the 110 Clerget and the 110 Le Rhone would be wanted, and some time was consumed in comparing the two engines. In the end the Le Rhone was ordered, but after a lapse of some 12 months or more from the time when there was difficulty in procuring them from the French Government. We think this delay was too long, and that it would have been an advantage to the Royal Flying Corps to have been in possession of this engine in quantities earlier.

44. It is the fact that the R.A.F. Napier 200 h.p. engine has been ordered in large quantities and that these orders were placed before the engine had been proved. General Henderson explained to us that in war time one must sometimes gamble on an engine and trust to luck. This engine was being designed simultaneously with the 250 h.p. Rolls-Royce, upon which the directorate did not gamble. We think the reason why the R.A.F. Napier engine was selected

for the gamble was because it was—at any rate, partly—of R.A.F. design, and that this is an instance in which great reliance has been placed on the R.A.F. The engine has been adversely criticised, but whether the faith reposed in the R.A.F. in this case was "blind" or not remains to be seen.

45. Had the Le Rhone engine been procured earlier, a few might have been spared to private firms in order to see whether they could design an improved type of aeroplane in which to fit it, but we are satisfied that, within the limits of the engines actually available, no undue preference has been given to the R.A.F.

46. Opportunities were given to the Aircraft Manufacturing Company which resulted in the de Havilland Scout. Several important firms are engaged upon experimental machines at Government expense. Other private firms, at the request of the directorate, have been trying to design machines for certain high-powered engines, including various types of the Green engine, all so far without result. It is obvious that, in designing aeroplanes, opportunity and accomplishment are not interchangeable terms.

47. A salient fact in this connection is one to which we have already referred, namely the stopping of the designing of the 200 h.p. R.A.F. water-cooled engine and handing the drawings to the Rolls-Royce and Napier Companies.

48. In the matter of opportunity, private firms have nothing of which to complain.

49. The truth is that a charge of this nature will always be made and will be believed so long as there is one person responsible for the Royal Flying Corps as a fighting force, and, at the same time, both for its equipment and for the R.A.F. The position is, in our opinion, an impossible one.

## CHARGE 3.

50. (a), (b), (c), (d) are all charges against the R.A.F.

51. It was said that the feeling of the Trade against the R.A.F. was strong and bitter. It may be so, but it is singular that, while several witnesses who were not Trade witnesses spoke to this feeling, the Trade itself was dumb. In the absence of assistance from any Trade witnesses, we have formulated to the best of our ability the charges against the R.A.F. made to us on their behalf. We can only hope that it will be found that we have included, at any rate, the most serious of the grievances to which the Trade feels itself unable to give expression—except perhaps in confidence to a sympathetic friend or in furnishing inaccurate copy for an anonymous newspaper correspondent.

## Charge 3 (a).

52. The ascendancy of the R.A.F. we have dealt with in our observations on the "too blind faith" charge.

## Charge 3 (b).

53. This is the "competitor and judge" charge. Some of the witnesses went so far as to say that the R.A.F. was a competitive manufacturer with private firms. This is so contrary to the fact that we frankly do not believe that any private manufacturers honestly entertain that opinion, and we dismiss the suggestion as frivolous.

54. The R.A.F. has built no engine except experimentally, and has only constructed for use 77 aeroplanes, of which 50 were to assist a private maker in the fulfilment of an order.

55. The more correct way of stating the charge under this head is as follows:—The R.A.F. designs aeroplanes and engines; private makers' designs are submitted to the R.A.F. and private makers' productions are tested by the R.A.F., so that in matters of design and test the R.A.F. is both competitor and judge.

56. The charge so stated is not in accordance with the fact, in that private makers' designs are not submitted to the R.A.F. Private makers furnish stress diagrams, which are submitted to the R.A.F., and this may have led to some misapprehension. That does not, however, entirely dispose of the charge, and we think there is some substance in it. No one on the actual staff of the R.A.F.—that is, no one from the Superintendent downwards—has any voice in the selection of either aeroplanes or engines. The ultimate decision in these matters rests with General Henderson. He, naturally, seeks advice, and there is an advisory staff whose duty it is to make preliminary investigations into new types of aeroplanes and engines submitted for adoption, to get all the necessary information and details into order so as to be able to report upon these to General Henderson,



and to assist him in selection or rejection. General Henderson sometimes also consults some officers of the Royal Flying Corps of special experience. The procedure is that general arrangement drawings are sent to the War Office and are examined in General Henderson's office by technical officers who take note of engineering points. An experienced pilot, who deals with the supply of aeroplanes, also examines the drawings. The Inspection Department is consulted, and General McInnes himself inspects and examines the drawings. The drawings, with the criticisms of these various officers, are then submitted to General Henderson, who accepts or rejects.

57. When an aeroplane is submitted for trial it is sent to the Central Flying School, and is there tried before the Commandant, two or three officers, and the Chief Inspector of Aircraft. R.A.F. designed aeroplanes are tried in the same way.

Engines of private design are tested at the R.A.F. under the direction of the Superintendent.

58. In substance the position is that, although great pains are taken to prevent the R.A.F. from having any direct voice in the selection of types of either aeroplanes or engines, engines are tested by the R.A.F. and most of the persons who advise General Henderson and who try the aeroplanes belong to the department which has the control of the R.A.F., while General McInnes is the head of that department, subject, of course, to General Henderson. We do not see how the feeling of the trade, which we are informed exists, that their designs may not receive fair treatment or their finished products fair tests in competition with those of the R.A.F., can be removed under existing conditions.

*Charge 3 (c).—The R.A.F. has been a Dis-service and not a Service to the Royal Flying Corps.*

59. The first branch of this criticism in effect amounts to the charge that the designs of the R.A.F., whether of aeroplanes or engines, have not been efficient. That the R.A.F. has produced unsatisfactory designs of aeroplanes cannot be doubted, but the R.A.F. exists to make experiments, and it is inevitable that some experiments must fail.

60. The R.A.F. has produced many designs which have done admittedly good service. The B.E. 2 type marked a great advance in aeronautics. The F.E. type is good. The R.E. 7, too, has answered its purpose, but upon the question whether in this war the R.A.F. has well served the Royal Flying Corps, the R.A.F. must be judged by its principal achievement, the B.E. 2c aeroplane combined with the 90 h.p. R.A.F. engine. This is the combination which has been used in far larger numbers than any other, and by it the R.A.F. must, in our judgment, stand or fall. Which is it to do? In answering this question, we bear in mind that at the time the R.A.F. engine was produced, the only possible alternative engine of English design was the Green engine, for which no one has so far produced a satisfactory aeroplane. There was no inherently stable machine of private design. The B.E. 2c was strong, the design was aeronautically sound, the drawings were complete. This last circumstance enabled many manufacturers, entirely new to the trade, to build an aeroplane who could not otherwise have done so. Looking at things as they were at the beginning of the war, we adopt the language of one of the witnesses who appeared before us, Mr. A. E. Berriman, the Chief Engineer of the Daimler Company:—

"The R.A.F. engine and the B.E. 2c aeroplane have their defects, but they form a combination that has been instrumental in enabling the Flying Corps to perform invaluable service to the Army in France,"—service, we may add, which would, in our view, have been impossible without this combination, at any rate, for many critical months.

61. Much of the criticism of the B.E. 2c machine fitted with the R.A.F. 90 h.p. engine has been ill-founded. As an illustration of this, we may refer to the evidence of one of the witnesses who stated that he was absolutely convinced that a tractor machine is worse than useless for night-flying, and that it was either negligence or ignorance of the authorities to allow night-fliers to use tractors such as the B.E. 2c.

62. It is a striking commentary on this evidence that all the three airships which were brought down in flames on the nights of September 2nd, September 23rd and October 1st last were brought down by pilots flying B.E. 2c machines fitted with R.A.F. engines.

63. It is proper to add that stable machines are admitted to be essential for night flying, and the only machines that are now used for that purpose are the B.E. 2c, a tractor, and the F.E. 2B, a pusher, both of which are essentially stable.

64. The later productions of the R.A.F. are not, on the whole, as good as some of the machines now produced by private manufacturers, but are more readily obtainable.

65. In arriving at our conclusion on the B.E. 2c aeroplane fitted with the 90 h.p. R.A.F. engine, we have not forgotten the complaints that, after the drawings of the B.E. 2c and the 90 h.p. R.A.F. engine were sent to the manufacturers, they were constantly being altered in detail, thus creating delay and confusion. There were, in fact, more alterations than one would expect. These, however, were, to some extent, due to the desire to meet manufacturers' own views and objections, and to the fact that it was felt to be necessary to supply aeroplane makers, many of whom had no previous experience, with the most exact drawings, even of the smallest altered parts. In the case of the engine, we think this was overdone, and it would have been well to have given a freer hand and more initiative to the drawing and designing staffs of the engine builders, many of whom, though new to aero engine work, had long experience in motor engine building.

66. The second branch of Charge 3 (c) is that the R.A.F. has discouraged private manufacturers. The evidence of three of the four manufacturers who appeared before us is all the other way, the fourth did not refer to the point.

67. In several cases, makers of aeroplanes and engine builders new to the work have sent their foremen to the R.A.F., who have obtained there much useful information and instruction. The testimony of one of these trade witnesses, a large contractor, is worth quoting:—

"It would be impossible for me to go away from this committee without expressing the gratitude which I feel towards General McInnes and every officer of every department, from the head of the War Office to the bottom of the War Office, for the assistance which is given to me. There is every possible ambition to help me to succeed in the very difficult work which I am doing, very often under very difficult circumstances, and I for one would dissociate myself from any adverse proposition in respect to General Henderson and his staff. People say that they do not seem to help manufacturers and contractors, but I have had nothing but the utmost possible assistance that a human being could have."

68. On the other hand, General Henderson complained that the tact and judgment of some of the subordinate officials of the R.A.F. had been deplorable, and we can well believe that some private manufacturers who came into contact with these subordinate officers have genuine cause of complaint. Indeed, we are inclined to think that this lack of tact may be answerable for much of the dissatisfaction which the trade is alleged to feel.

*Charge 3 (d).—Manufacturers' Designs have been copied by the R.A.F. for their own use.*

69. There was one regrettable instance of an attempt to do this. We have investigated the matter thoroughly, and are satisfied that, as soon as it was known to the highest authority, it was immediately stopped and measurements which had been taken of the section of the wing of an aeroplane were destroyed.

**CHARGE 4. THE INSUFFICIENT TRAINING OF PILOTS AND OBSERVERS.**

70. Much was said about the insufficiency of the training of our pilots in flying, bomb-dropping and in fighting in the air. Instances were given of pilots being sent to the front after only five hours' flying. There is no doubt that in the early days of the war, when the demand for pilots suddenly and enormously increased, some were sent out with insufficient experience in flying. This was inevitable in the situation in which the Royal Flying Corps found itself, and no blame can be attached to it in this respect. It follows that pilots were also inexperienced in bomb-dropping and in fighting in the air. Observers were, for the same reason, insufficiently trained.

71. The most strenuous efforts have been made to remedy this state of affairs, and the present system of training pilots, except in regard to fighting in the air, meets with our unqualified approval. Training is still, however, hampered to some extent by shortage of instructors as well as by shortage of school aeroplanes, which explains the fact that there is still a long waiting list of would-be pilots. Such steps as are possible, having regard to the demand for pilots and aeroplanes for more imperative needs, are being taken.

72. There was no school for air fighting until September, 1915, when a small one was established at Hythe. There was no doubt a shortage of machine guns, but that shortage does not account, in our opinion, for the fact that the war had been proceeding for over a year before an aerodrome was fitted up for aerial musketry, and then a by no means sufficient one. Why this aerodrome was not opened for aerial musketry sooner is not apparent, but it is evident that the provision of others has, up to now, proved an almost



insurmountable difficulty. To provide an area of safety a very large tract is required—and this is not easy to acquire in a thickly populated country like the British Isles—but the problem should, we think, have been solved long ere this.

73. There have been many cases of pilots and observers having to fight in the air without a sufficient knowledge of their weapons; but although all receive a fair training in this respect now, the training would become much more efficient if special aerodromes were developed for the purpose.

74. In reading the records of the flying in France, we have been much struck by the frequency with which the machine guns are reported to have jammed in the earlier days of the serious fighting in the air, as well as by the apparent inaccuracy of the shooting. The latter view we have formed from the large number of rounds fired—often at very close quarters—without apparently any effect; and we may remark that inaccuracy of fire from the German guns is equally apparent. It is well known that jamming of machine guns is, and always has been, a matter of common occurrence, and, further, that accurate fire from one rapidly moving object against another rapidly moving object is extremely difficult; but it is also known that improvement in both directions comes with careful training. It was largely a result of the careful musketry training of the Army in peace that British troops were able to hold their own against the superior numbers and the less expert riflemen of the Germans in the first battles of the war, and we consider that similar careful training of British airmen in aerial musketry would prove an equally important factor in battles in the air.

75. It is gratifying to note that while during this year there have been a very great number of fights in the air the number of reported cases of jamming of machine guns has very greatly diminished, and, indeed has now, so far as we have been able to ascertain, become almost negligible.

76. In connection with the training of pilots, it has been suggested that a school should be established in some place where the climate would admit of more hours flying per day than does our own especially in winter. The south of France was spoken of. We understand this is a suggestion which has been receiving attention and is being acted upon.

77. Some complaint was made that civilian training schools for pilots had not been taken advantage of to the full extent. We are satisfied that this is not so, and that everything possible has been done and is being done in this respect.

78. Observers, in the early days of the war, were of necessity employed without experience. As the war proceeded, this defect was gradually remedied. Observers are mostly drawn from the fighting officer ranks of the Army, and now they become observers on probation before qualifying for the post of trained observers. The training seems to us fairly satisfactory, except in regard to the use of the machine gun and fighting in the air.

79. The importance of the observer cannot be over-estimated, and this work is said, on unimpeachable authority, to be more difficult and more trying to the nerves than that of the pilot. The observer too must have sufficient military training to be able to recognise what is of real military interest, such as formation of troops, trenches, batteries, suspicious hostile movements and the like. He must also have sufficient knowledge of artillery fire to be able to judge its effect and report for the guidance of the gunners below. In addition, he must understand photography, bomb-dropping and his machine gun.

80. A very special combination of knowledge and alertness is thus required, and it seems strange that no encouragement by way of promotion is offered to the observer, unless he becomes a duly qualified pilot. The result is that observers of experience frequently give up their duties at the front, where their experience is badly wanted, and come home to learn to fly and take a pilot's certificate.

81. We consider that, after the war, the ideal to be aimed at is that pilots and observers should be interchangeable. Meanwhile, we think more encouragement should be given to the observers to remain observers, and we later make a recommendation to that end.

#### CHARGE 5.—HOME DEFENCE.

82. A good deal of confusion has arisen upon the subject as to whether the air services of the Army or the Navy are responsible for Home Defence, or whether the responsibility is divided. The truth is that the Navy was entirely responsible till the middle of February last. Since that date the responsibility has been divided. The Navy is responsible until hostile aircraft reach our shores. From that time the Army is responsible. It is hardly necessary to state that if a Naval machine was attacking hostile aircraft it would not cease to do so because the aircraft crossed the boundary line

(high water mark), nor would an Army machine cease to pursue hostile aircraft when it passed over the line seawards.

83. The Royal Flying Corps is not responsible for anti-aircraft guns. It has no control over them. Nor has it any responsibility for or control over the searchlights which work in connection with those guns. The Royal Flying Corps now has, however, its own searchlights wherever Home Defence machines are maintained.

84. The defence of the London Area is under the immediate control of the Commander-in-Chief for Home Defence. In other areas, subject to his general control, it is under that of the Army officers in command of the particular anti-aircraft defence areas. Those areas are not co-terminous with the districts commanded by the officers in charge of Home Defence from attacks other than by aircraft.

85. We have appended a Memorandum on the subject of Home Defence\* going more into detail than seems advisable in the body of this Report.

86. It seems desirable to mention that, while the Navy was still solely responsible for Home Defence, Lord Kitchener issued an order that Army aeroplanes were to render all possible assistance, an order which was very willingly obeyed.

87. The Navy have aerodromes for their own purposes along the coast, and we think it reasonable to assume, although we have no knowledge on the subject, that, now that the Army is responsible for Home Defence from the coast inwards, a similar order has been issued to the Navy.

88. Having regard to the limitations imposed by the number of aeroplanes, pilots and night landing-places as yet available, we do not know that, so far as the Royal Flying Corps is concerned, anything more can be done.

89. It ought, we think, to be generally known that Home Defence machines and pilots are not now stationed at every aerodrome. It must not be supposed that, because aeroplanes are seen flying freely day by day from a given aerodrome, there are necessarily any aeroplanes kept at that aerodrome fit for night-flying or any night-flying pilots there to fly them. Home Defence machines, with their pilots, are now grouped at various centres, a plan which, after careful consideration, we approve.

#### CHARGE 6.—LOSS OF MASTERY IN THE AIR.

90. This charge relates to the period of some six months, beginning in about October, 1915, when the German Fokker machine made its appearance.

91. For more than a year after the beginning of the war there was practically no fighting in the air. Our machines made their reconnaissances with regularity and without serious molestation. Then suddenly the German tactics changed. They produced the Fokkers—fast, handy, fighting machines that lay in wait for our machines and mobbed them. We were slow in recognising this change of tactics and slow in adopting means to protect our reconnaissance machines, with the result that we suffered many casualties. As an instance, there were 12 deaths in the first half of March last. The casualties, however, were not all on our side. The German losses during the six months in question were heavier than ours, and equally heavy in any given month, which is remarkable, as it is clear from the evidence that British airmen carried out far more work over the enemy's lines than the Germans did over ours.

92. The B.E. 2c was our chief reconnaissance machine, and it was to fliers of that machine that most harm was done. The B.E. 2c was not so fast or so handy as the Fokker, and needed, after the appearance of the Fokker, to be escorted by fighting machines. This is now being done.

93. Reports from the front are singularly diverse as to the extent to which superiority was for a time lost. The battle-front was a long one, and it is obvious that, as was to be expected, the state of affairs differed considerably at various parts of the line. In some places the German superiority for a time seemed marked, in others it was non-existent.

94. Such local inferiority as there was seems to have been chiefly due to our tardy recognition of the change brought about by the Fokker, but we think that, although we had at the front at all times machines capable of dealing with the Fokker on at least equal terms, these machines were not at first available in sufficient numbers.

95. Our temporary loss of superiority has been described in language of such gross exaggeration as to make us at first disposed to think there was nothing in it; but a careful examination of all the facts leads us to the conclusion that the charge is true to a limited extent, and in the sense indicated.\*

96. Our newer aeroplanes, which are now coming forward in greater numbers, are proving individually superior to those

\* Not printed.

of the Germans; and, while there must be casualties where there is fighting, our early superiority has been more than regained.

## CHARGE 7.—VARIOUS DEFECTS IN AERODROMES AND SYSTEM OF LIGHTING LANDING GROUNDS.

97. The chief complaints against aerodromes and night landing places were that they were insufficient in number, some of them too small, and some of them unsafe by reason of the surface being rough, such as ridge and furrow, or intersected by hedgerows or dykes.

98. Most of these complaints related to the earlier period of the war, and, except as to size, were probably well founded. They afford another instance of the unpreparedness of the Flying Corps for a war of this magnitude.

99. We are satisfied that the Royal Flying Corps has done all that could be expected of it in the way of increasing the number of aerodromes and landing places, and in the way of their improvement, especially when the shortage of available labour is taken into account.

100. Perhaps Hythe is the least satisfactory instance, where the trouble from dykes is only just being surmounted.

101. The Dover aerodrome was criticised because of its situation on the top of high cliffs. It was stated that, in landing, inexperienced pilots had difficulty in keeping the nose of the machine sufficiently high. On the other hand, pilots whom we interviewed on the subject were quite satisfied with it. Some of them indeed were loud in its praises. We see no reason for closing it.

102. The only aerodrome which can be criticised on account of its size is Croydon, which measures 500 yards by 460 yards. This is, judging by other aerodromes, on the small side, but is, we think, reasonably sufficient.

103. Night-flying is, as far as possible, forbidden at aerodromes where the state of the surface is such as to present unusual difficulties on landing.

104. We think the landing ground and aerodrome problem has been, upon the whole, energetically and skilfully tackled.

105. The complaint about lighting is that the British system is inferior to the French and German systems.

106. All three systems are different. The British is by petrol flares. The French is by electric light. The German is said to be by powerful searchlights slightly shaded, directed up wind along an aerodrome.

107. It is inadvisable to discuss the British or French systems in detail. Of the German system little is known. There is an unanimous consensus of opinion among all the many pilots whose opinion we asked that the British system is a good one, that they are satisfied with it and do not desire a change. Many of them pointed out the well-known fact that, when the weather is at all thick, the yellowish flame of a petrol flare is easier to see than an electric light, even though the latter is transmitted through coloured glass.

In a recent experiment at Upavon, a new system, called "Triplex glass landing lights," proved to be inferior to petrol flares.

108. We see no reason to suggest any change, and find no present ground of complaint.

## CHARGE 8.—THE INADEQUATE ARMING OF AEROPLANES.

109. When this great war was sprung upon the country, the question of using aeroplanes for more than reconnaissance and observing artillery fire, as also the important part machine guns were going to play both in the air and on land, had hardly been considered. Provision had only been made for an extremely limited number of machine guns for existing cavalry regiments and infantry battalions, and none for the enormous quantities which were to be required later. It was a long time before the necessary machinery for meeting this great increase in output could be provided, and, as the guns became available, the comparative urgency of supplying the land and air had to be dealt with. Thus, it was March or April, 1915, before the squadrons at the front got four-fifths of their complement of machine guns. Even then, however, and indeed up to a much later date, it was not considered possible to supply the requirements at home.

110. In the absence of machine guns there was nothing for it but to arm the men in the machines with rifles, and this is what really happened; it is on this largely that the complaints appear to be based.

## Aircraft and Artillery.

Writing in the *Journal* of December 30th on his visit to the British front, M. André Tudesq says:—

"During the last forty-eight hours the English cannon thunders furiously to the north of the Somme. We see in these operations the direct effect of the clear weather, which for the last two days has favoured aeroplane reconnaissances,

111. The provision of weapons such as machine guns, bombs, hand grenades, darts, &c., fell under the able hand of the Master-General of the Ordnance; and the Committee are unable to find any delay on the part of the Royal Flying Corps in making use of any of these, or in providing mountings, racks, &c., for them, within a reasonable time of their being allotted to the Corps. Experiments had to be made; and in some matters considerable time spent, before the most suitable way of carrying the several war requirements in aeroplanes was discovered, if indeed it has been discovered yet.

112. We have now dealt with what we have described as the charges of a general character against the Royal Flying Corps, and proceed to a number of specific charges of alleged maladministration and slackness.

## Specific Charges.

113. The specific charges and criticism which we propose to discuss are:—

- (a) (1) Pilots are allowed to fly "dud" machines home from France.
- (2) Insufficient attention is paid to the condition of training machines and of their equipment.
- (3) Machines are, or have been, flown at the front overloaded with all kinds of equipment and apparatus. They are called "Christmas Tree" machines.
- (b) (1) Failure to buy machines and engines from America.
- (2) Failure to utilise English firms to the best advantage, e.g., The Sunbeam, The Vauxhall and the Rolls-Royce.
- (c) The representatives in Paris of the Royal Flying Corps and the Royal Naval Air Service worked very badly together, and were not on speaking terms.
- (d) Zeppelins ought to be raided in their sheds.
- (e) All machines carrying an observer should be fitted with dual control.
- (f) Pilots have not been provided with proper maps, compasses or altimeters.
- (g) General Henderson opposed the building of airships.
- (h) General Trenchard had no sufficient training in flying.
- (i) General Henderson declined to allow Lewis guns to be sent to the French in exchange for engines.
- (j) General Henderson
- (m) There is excessive flying in order to create a misleading record.
- (n) No machines went up on the occasion of the Dover raid in January last.
- (o) The day after Mr. Pemberton Billing's election, 74 pilots were sent home for further training.
- (p) The following cases of accidents and misadventures:—
  - (1) The mishaps to machines on January 31st last.
  - (2) The mishap to the De Havilland Squadron.
  - (3) The landing of an F.E. 2D machine with a Rolls-Royce engine at Lille, instead of St. Omer, on June 1st last.
  - (4) The death of Second Lieutenant Yates (No. 14 Squadron) in Egypt. Wings of aeroplane folded up in the air.
  - (5) The deaths of Lieutenant H. A. V. Hobbs and Second Lieutenant Tudor Jones, flying a Morane Parasol in December, 1915; and later, Lieutenant Palmer, engaged in a long reconnaissance, accompanied by a Morane Scout, shot down by the enemy flying a faster machine.
  - (6) Second Lieutenant Tennant's case.
  - (7) Second Lieutenant Chamberlain's case. Killed owing to the breaking of the right wing of his aeroplane in the air.
  - (8) Second Lieutenant Collier, said to have lost his way on October 22nd, 1915, owing to the absence of suitable map and compass. He landed with new Morane at Louvain, and was captured by the enemy.
  - (9) Lieutenant Downer: Alleged faulty construction of aeroplane.
  - (10) The faulty machine sent from Beaulieu to Hythe.
  - (11) The fatal accident to Captain Allen and Mr. Burrows.

(To be continued.)

and the contact with the enemy artillery has not remained without its reaction. In the only sector bombarded we have been able to locate a large number of their batteries, which tried to counter the English batteries, but the duel turned to the confusion of the Germans. The positions of their big mortars are notified by our airmen as entirely destroyed, and the German trenches also have suffered greatly."



# The British Air Service

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

## Royal Naval Air Service.

Admiralty, December 22nd.

A. W. F. Smith granted a temp. commission as Lieut., R.N.V.R., and appointed to "President," additional, for R.N.A.S., date Dec. 21st.

The under-mentioned granted temp. commissions as Sub-Lieut., R.N.V.R., and appointed to "President," to date as stated: F. C. F. Walwin and L. W. Rudd, Dec. 21st; J. E. Haswell, Dec. 12th.

The following have been promoted to Temp. Sub-Lieut., R.N.V.R., and appointed to "President," additional, for R.N.A.S., to date as stated: Chief Petty Officer A. G. Osmond, Dec. 20th; Air-Mechs. G. G. Speight (1st grade) and C. A. Stephenson (2nd grade), Dec. 20th.

H. B. de Wilde entered as Prob. Flight Officer for temp. service, date Dec. 27th.

The following entered as Prob. Flight Officer for temp. service, and appointed to "President," additional, for R.N.A.S., date as mentioned: E. H. F. Scott, Dec. 21st; J. F. Mead and J. B. Bowes, Dec. 31st; P. Wickens, Nov. 22nd; and P. B. Adderley, Nov. 30th.

Admiralty, December 26th.

Lieut. S. P. Colt and Temp. Lieuts., R.N.V.R., N. P. Playford and G. P. C. Greene entered as Prob. Flight Officers for temp. service, all to date Dec. 23rd; also Messrs. L. A. Jessop, F. Bray, K. F. Hilder, M. S. Varden, W. D. Cliften, and J. P. W. Amos, to date Dec. 31st.

Admiralty, December 28th.

**Temporary Flight Sub-Lieutenants.**—E. J. B. How, W. Huggan, W. G. McMinnies, and C. R. Carr promoted to Temp. Actg. Flight Lieuts., seniority Dec. 24th.

**Probationary Flight Sub-Lieutenants.**—E. V. White and H. Burns granted temp. commissions as Sub-Lieut., R.N.V.R., and appointed to "President," for R.N.A.S., date Dec. 27th.

Chief Petty Officer R. Champness granted a temp. commission as Sub-Lieut., R.N.V.R., and appointed to "President," additional, for transport duties with R.N.A.S., date Dec. 26th.

The following entered as Prob. Flight Officers (temp.), with seniority as stated, and appointed to "President," for R.N.A.S.:—F. A. Major and W. N. Smith, Nov. 30th; A. G. Hodgson, Nov. 28th; H. A. Coon and W. W. Pitt, Dec. 7th.

Admiralty, December 31st.

**Commander to be Captain.**—C. L. Lambe now Actg. Capt., Dec. 31st, 1916.

**Lieutenant-Commander to be Commander.**—H. L. Woodcock (now Actg. Cdr.), Dec. 31st, 1916.

**Squadron Commanders to be Wing Commanders.**—S. D. A. Grey, D.S.O., C. J. L'Estrange-Malone, I. T. Courtney (now Acting Wing Cdr.), C. E. Risk, C. L. Courtney, C. E. H. Rathborne, J. N. Fletcher, T. R. Cave-Browne-Cave, J. D. Mackworth, A. W. Bigsworth, D.S.O., R. P. Ross, E. T. R. Chambers (now Acting Wing Cdr.), Dec. 31st, 1916.

**Squadron Commander for Temporary Service to be Acting Wing Commander.**—A. Ogilvie, Dec. 31st, 1916.

**Flight Commanders to be Squadron Commanders.**—C. E. Maude, J. H. Lidderdale, C. D. Breese (now Actg. Sqd. Cdr.), E. R. C. Nanson (now Actg. Sqd. Cdr.), E. H. Sparling (now Actg. Sqd. Cdr.), J. W. O. Dalgleish, G. R. Bromet (now Actg. Sqd. Cdr.), L. Tomkinson, H. Delacombe (now Actg. Sqd. Cdr.) (for temp. service), E. T. Newton-Clare, A. Corbett-Wilson, H. R. Busteed (now Actg. Sqd. Cdr.), J. W. K. Allsop (for temp. service), C. H. Butler, D.S.C. (for temp. service), F. K. Haskins, D.S.C. (now Actg. Sqd. Cdr.), H. Stanley-Adams, R. H. Jones, C. M. Murphy (now Actg. Sqd. Cdr.), D. C. S. Evill, D.S.C., J. P. Wilson, D.S.C., the Master of Sempill (for temp. service), V. G. Blackburn, D.S.C. Dec. 31st, 1916.

**Flight Lieutenants to be Flight Commanders.**—H. A. Buss (for temp. service), F. A. Brock, B. Binyon (now Actg. Flight Cdr.) (for temp. service), A. W. Clemson, the Hon. G. de St. C. Rollo (for temp. service), E. R. Moon (for temp. service), M. S. Marsden, D. Iron, A. F. Bettington, M. E. A. Wright, R. E. Penny, F. J. Rutland, D.S.C., A. P. Mackilligin (for temp. service), E. J. C. Roberts, J. S. Mills, D.S.C. (now Actg. Flight Cdr.), P. Legh, E. J. Hodson (now Actg. Flight Cdr.), A. S. Maskell, B. S. Benning, S. E. Ritchie, C. H. C. Smith, D.S.C., R. M. Field, G. F. Breese (now Actg. Flight

Cdr.), J. C. Brooke, W. L. Welsh, I. Fraser (for temp. service), T. D. Hallam, D.S.C. (for temp. service), T. A. Batchelor, B. Travers (now Actg. Flight Cdr.), J. C. P. Wood, E. F. Moyes, A. Q. Cooper (for temp. service), F. W. Gamwell, R. D. G. Sibley, D. P. Openshaw, C. E. Brisley (for temp. service), W. G. Moore, T. V. Lister, T. F. N. Gerrard (now Actg. Flight Cdr.), J. E. B. Maclean, T. Hinshelwood, B. D. Kilner, E. de C. Halifax, R. H. Mulock, D.S.O. (now Actg. Flight Cdr.), F. W. Lucas, G. W. Cranfield (for temp. service), W. C. Michie (for temp. service), R. B. B. Colmore (now Acting Flight Cdr.), R. S. Dallas, D.S.C. (for temp. service), C. R. Mackenzie, D.S.O. (for temp. service). Dec. 31st, 1916.

**Flight Sub-Lieutenants to be Flight Lieutenants.**—W. Tesh, C. H. W. Godfrey, H. Hall, J. A. Barron, L. E. R. Murray, J. F. Roche, J. E. M. Pritchard (for temp. service), A. H. Sandwell (for temp. service), W. B. Lawson (for temp. service), J. E. Morgan, E. A. Pearson (for temp. service), L. G. Sieveking, T. F. Morris (now Actg. Flight Lieut.) (for temp. service), J. Wann (for temp. service), L. Morgan, A. N. Gallehawk (now Actg. Flight Lieut.) (for temp. service), H. G. R. Malet, F. E. P. Barrington, W. Perham, S. Kemball (for temp. service), N. E. Stirling (for temp. service), W. P. D. C. Scott (for temp. service), H. D. Hyde (for temp. service), F. W. Walker (for temp. service), J. B. Cussen (for temp. service), C. A. Maitland-Heriot (for temp. service), H. V. Reid (for temp. service), A. M. Blake (for temp. service), G. E. Williamson (for temp. service), L. C. Shoppee (for temp. service), A. T. Moore (for temp. service), R. F. E. Wickham (for temp. service), H. R. C. Dewes (for temp. service), W. Man (for temp. service), R. A. W. Adkins (for temp. service), H. G. Ford (for temp. service), P. Laing (for temp. service), R. E. Bush (for temp. service), H. L'E. Tyndale-Biscoe (now Actg. Flight Lieut.) (for temp. service), W. T. S. Williams (for temp. service), J. A. Sadler (for temp. service), A. Gammon (for temp. service), W. A. Davies (for temp. service), R. S. W. Dickinson, D.S.O. (for temp. service), H. Sherwood (for temp. service), K. C. Buss (now Actg. Flight Lieut.) (for temp. service), F. R. Sadd (now Actg. Flight Lieut.) (for temp. service), N. G. Stewart-Dawson (for temp. service), W. S. Wilson (for temp. service), G. Smethurst (for temp. service), F. P. Reeves (for temp. service), W. H. Peberdy (for temp. service), F. D. Till (for temp. service), G. W. R. Fane (for temp. service), T. F. Le Mesurier (for temp. service), H. A. Peck (now Actg. Flight Lieut.) (for temp. service), E. L. Ford (for temp. service), R. D. Delamere (for temp. service), W. G. McMinnies (now Actg. Flight Lieut.) (for temp. service), L. G. Scott (now Actg. Flight Lieut.) (for temp. service), I. N. C. Clarke (for temp. service), H. L. Wood (for temp. service), A. B. Watkin (now Actg. Flight Lieut.) (for temp. service), E. L. Pralle (now Actg. Flight Lieut.) (for temp. service), H. G. Holden (for temp. service), I. de Burgh Daly (for temp. service), F. C. C. Calder (for temp. service), M. J. G. Day (for temp. service), E. L. Pulling, D.S.O. (for temp. service), E. T. Bradley (for temp. service), R. J. O. Compton (for temp. service), H. J. Arnold, D.S.O. (for temp. service), G. R. S. Fleming (for temp. service), C. H. Darley (for temp. service), E. Potter (for temp. service), R. Grahame, D.S.C. (for temp. service), W. E. Gardner (for temp. service), A. S. Todd (for temp. service), A. J. O'Reilly (for temp. service), A. W. Cassy (now Actg. Flight Lieut.) (for temp. service), E. F. Turner, C. D. Booker (for temp. service), H. G. Hall, D.S.C. (for temp. service), F. M. Fox (for temp. service), E. R. Grange (for temp. service), J. Robinson (for temp. service), L. O. Brown (for temp. service), G. Thom (for temp. service), J. K. Waugh (now Actg. Flight Lieut.) (for temp. service), A. M. Shook (for temp. service), G. G. MacLennan (for temp. service), F. J. McConnell (for temp. service), D. M. B. Galbraith, D.S.C. (for temp. service), H. R. Wambolt (for temp. service), L. S. Breadner (for temp. service), J. W. Alcock (for temp. service), H. D. Graham, R. S. Sugden, A. G. McEvan. Dec. 31st, 1916.

**Temporary Lieutenants (R.N.V.R.) to be Temporary Lieutenant-Commanders (R.N.V.R.).**—R. W. Hogarth, F. C. Williams, J. B. Harrington. Dec. 31st, 1916.

Admiralty, January 1st.

The following entered as Prob. Flight Officers for temp. service, and appointed to "President" for R.N.A.S., to date as stated: E. H. Kendall, F. Benzie, A. M. Alexander,

B. M. J. Davis, S. S. Flook, T. O. Simpson, O. E. Worsley, A. S. Readwin, and H. F. Potter; Jan. 14th. A. Nightingale; Dec. 31st.

## Royal Flying Corps (Military Wing).

*London Gazette Supplement, December 21st.*

**Memoranda.**—The undermentioned Cadets to be Temp. 2nd Lieuts. for duty with R.F.C. Aug. 14th: C. F. Jex, J. H. Hayward. The undermentioned to be Temp. Lieuts. (on prob.): Pte. R. J. Paton, from A.S.C., for duty with R.F.C. Dec. 8th: F. Bretherton. Dec. 12th: Acting-Sergt. E. W. Lawrence to be 2nd Lieut. for duty with R.F.C.; Dec. 22nd.

**Supplementary to Regular Corps.**—The undermentioned 2nd Lieuts. (on prob.) resign their commissions. Dec. 22nd: S. S. Jefferies, H. Fuller-Clark. The undermentioned 2nd Lieuts. (on prob.) relinquish their commissions an account of ill-health. Dec. 22nd: R. A. B. Hall, A. P. Boney. 2nd Lieut. (on prob.) L. H. Clifford is confirmed in his rank. The undermentioned to be 2nd Lieuts. (on prob.): J. H. Cotton; Nov. 28th. A. G. Smith; Dec. 1st. Dec. 5th: G. R. Shibley, C. E. Rushworth, A. E. McKeever, H. Smith; Dec. 8th.

*London Gazette, December 22nd.*

**Flight Commanders.**—From Flying Officers, and to be Temp. Capt. whilst so employed:—Dec. 5th: 2nd Lieut. E. G. Whelon, R. Suss. R. (T.F.); Temp. 2nd Lieut. F. S. Moller, M.C., Gen. List; 2nd Lieut. J. C. Griffiths, S.R.; 2nd Lieut. R. P. Harvey, M.C., 5th Lrs. Temp. Lieut. E. C. Winkley, Gen. List; Dec. 14th.

**Flying Officers.**—Lieut. R. A. P. Johns, 20th Hrs., and to be sec'd.; Dec. 3rd. Dec. 5th: 2nd Lieut. (on prob.) P. G. Taylor, S.R.; Temp. 2nd Lieut. G. W. Bentley, R. Fus., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) G. M. Underwood, Gen. List. Dec. 6th: Lieut. G. R. E. Hayter, Hamps. R. (T.F.); Lieut. C. C. S. Montgomery, 4th Canadian Pioneer Bn.; 2nd Lieut. H. T. Berry, 1st Inf. Bn., Australian Imperial Force. Temp. 2nd Lieut. A. Bell-Irving, Gen. List; Dec. 7th.

**Balloon Company Commanders (graded as Squadron Commanders).**—From Flight-Comdrs., and to be Temp. Majors whilst so employed:—Dec. 5th: Capt. F. M. Roxby, N. Staff. R., S.R.; Temp. Capt. J. O. Davis, Gen. List; Lieut. (Temp. Capt.) G. H. F. Faithfull, 126th Baluchistan Inf., Ind. Army; Temp. Capt. A. C. B. Geddes, Gen. List.

**Equipment Officers, 3rd Class.**—The appointment of Temp. 2nd Lieut. S. Mills, Gen. List, notified in the *Gazette* of Nov. 20th, is ante-dated to Sept. 1st. Nov. 2nd: 2nd Lieut. (on prob.) G. F. Harmer, S.R.; Temp. 2nd Lieut. (on prob.) W. A. Andrews, Gen. List. Temp. Capt. A. J. Dawes, S. Wales Bord., from Adj't., and to be transfd. to Gen. List; Nov. 4th. Dec. 6th: Lieut. C. V. Morris, R. War. R., S.R., and to be sec'd.; Temp. 2nd Lieut. (on prob.) J. E. Macloghlin, Gen. List; Temp. 2nd Lieut. (on prob.) W. J. Reid, Gen. List; Temp. 2nd Lieut. H. Nankivell, Gen. List; Temp. 2nd Lieut. (on prob.) H. Newns, Gen. List; 2nd Lieut. (on prob.) G. E. Quincey, S.R.; Lieut. R. Ross, Australian Flying Corps; Temp. 2nd Lieut. (on prob.) F. D. Reynolds, Gen. List; 2nd Lieut. (on prob.) H. C. Sharp, S.R.; Temp. 2nd Lieut. (on prob.) C. Rayner, Gen. List; Temp. 2nd Lieut. (on prob.) W. G. Ruggins, Gen. List; Temp. 2nd Lieut. (on prob.) E. L. Ravenscroft, Gen. List; 2nd Lieut. (on prob.) J. R. Taverner, S.R.; Temp. 2nd Lieut. C. H. Stafford, Gen. List; 2nd Lieut. (on prob.) W. D. Scott, S.R.; 2nd Lieut. (on prob.) T. Tatton, S.R.; Temp. 2nd Lieut. A. Smellie, Gen. List; 2nd Lieut. (on prob.) L. B. Clarkson, S.R.; Temp. 2nd Lieut. W. M. Edwards, Gen. List; Temp. 2nd Lieut. (on prob.) L. Cable, Gen. List; Temp. 2nd Lieut. (on prob.) T. B. Fraser, Gen. List; 2nd Lieut. (on prob.) C. C. Cruttenden, S.R.; 2nd Lieut. (on prob.) J. H. Fletcher, S.R.; 2nd Lieut. (on prob.) H. B. D. Grazebrook, S.R.; Temp. 2nd Lieut. A. L. Johnson, Gen. List; Temp. 2nd Lieut. (on prob.) T. N. Gilbert, Gen. List; 2nd Lieut. (on prob.) H. Gray, S.R.; 2nd Lieut. (on prob.) W. A. Haslam, S.R.; 2nd Lieut. A. Hawley, Gen. List. Temp. 2nd Lieut. (on prob.) A. H. Cabeldu, Gen. List; Dec. 13th.

**Supplementary to Regular Corps.**—2nd Lieut. (on prob.) A. A. McNeil resigns his commission; Dec. 23rd.

*London Gazette Supplement, December 23rd.*

**Wing Commander.**—Capt. (Temp. Maj.) G. B. Stopford, R.A., from a Squadn. Comdr., and to be Temp. Lt.-Col. whilst so employed. Dec. 12th.

**Squadron Commanders.**—From Flight Comdrs., and to be Temp. Majors whilst so employed. Dec. 1st: Capt. E. L. M. L. Gower, S.R.; Temp. Lieut. (Temp. Capt.) J. G. Swart, M.C., R.A.; Capt. A. H. Morton, R.A.; Temp. Capt. T. S. Impey, Gen. List; Capt. W. Milne, M.C., N. Lan. R., and to be sec'd.; Lieut. (Temp. Capt.) J. P. C. Cooper, M.C.,

S.R., from an Instr. in Flying, and to be Temp. Maj. whilst so employed; Temp. Capt. M. H. B. Nethersole, Gen. List, from a Flight Comdr., and to be Temp. Maj. whilst so employed.

**Equipment Officers, 3rd Class.**—Temp. 2nd Lieut. E. F. Hall, Gen. List; Aug. 28th. Temp. 2nd Lieut. (on prob.) G. W. Y. Swanson, Gen. List; Nov. 8th. 2nd Lieut. (Temp. Lieut.) E. W. Stubbs, L'pool R. (T.F.), from a Flying Officer (Observer); Nov. 27th. Dec. 1st: Lieut. (Temp. Capt.) A. D. S. Barr, High. Divl. Engrs., R.E. (T.F.); 2nd Lieut. H. V. Robbins, Bord. R., and to remain sec'd. The appointment of 2nd Lieut. J. E. Wight, S.R., notified in the *Gazette* of May 17th, is antedated to March 20th. Dec. 6th: 2nd Lieut. J. Morris, Unattd. List (T.F.); Temp. 2nd Lieut. (on prob.) S. Mercer, Gen. List; 2nd Lieut. (on prob.) F. C. R. Johnson, S.R.; 2nd Lieut. (on prob.) F. H. Jefferis, S.R.; 2nd Lieut. (on prob.) G. K. Johnson, S.R.; 2nd Lieut. (on prob.) H. H. Leage, S.R.; Temp. 2nd Lieut. (on prob.) G. A. B. Wheldon, Gen. List; Temp. 2nd Lieut. A. G. Tremain, Gen. List; Temp. 2nd Lieut. J. Wingate, Gen. List; 2nd Lieut. (on prob.) R. G. Whitcombe, S.R.; Temp. 2nd Lieut. P. G. White, Gen. List; 2nd Lieut. (on prob.) J. E. Terry, S.R.

**Memoranda.**—Qmr.-Sergt. R. H. Bright from R.F.C., to be 2nd Lieut., for duty with R.F.C.; Dec. 24th. Cadet L. C. H. Cave, to be Temp. 2nd Lieut. (on prob.) for duty with R.F.C.; Nov. 22nd.

The undermentioned to be 2nd Lieut. for service in the field:—

**For duty with Royal Flying Corps.**—Acting Sergt.-Maj. F. J. B. Powell, from R.F.C.; Nov. 16th. Qmr.-Sergt. W. Thorne, from R.F.C.; Nov. 16th.

The undermentioned to be Temp. 2nd Lieuts. (on prob.):

**For duty with Royal Flying Corps.**—Pte. W. K. Crewe, from Lond. R. (T.F.); Nov. 16th. Pte. J. Gagne, from Can. A.S.C.; Nov. 16th. 2nd Class Air-Mech. L. C. Row, from R.F.C.; Nov. 17th. Corpl. W. A. Golding, from H.A.C. (T.F.); Nov. 18th. Corpl. H. Fiske, from R.E.; Nov. 19th. Corpl. N. Rycroft, from R.E.; Nov. 21st. Nov. 22nd: Corpl. W. K. Carse, from R.E.; Pte. H. L. Waddington, from A.S.C.; Pte. H. J. Q. Campbell, from Can. A.S.C.

*London Gazette Supplement, December 27th.*

**Balloon Company Commander (graded as a Sqdn. Comdr.).** Temp. Capt. A. H. Parker, M.C., Gen. List, from a Flight Comdr., to be Temp. Maj. whilst so employed, and to retain his present appointment as Comdt. of a Balloon School of Instrn. Dec. 1st.

**Equipment Officers, 3rd Class.**—The date of the appointment of 2nd Lieut. F. Petch is June 23rd, and his rank as now described, and not as in the *Gazette* of Aug. 14th. Temp. 2nd Lieut. F. R. H. Logan, Gen. List. Oct. 12th.

**Experimental Officer, 2nd Class (graded as an Equipment Officer, 2nd Class).**—2nd Lieut. W. R. G. Atkins, S.R., from an Equipment Officer, 3rd Cl., and to be Temp. Lieut. whilst so employed. Nov. 25th.

**Supplementary to Regular Corps.**—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: J. E. Terry, R. G. Whitcombe, P. G. Taylor, H. C. Sharp, G. E. Quincey, L. B. Clarkson, H. Wilson, C. E. Bagram, G. K. Johnson, H. Gray, J. H. Fletcher, C. C. Cruttenden, F. C. R. Johnson, W. D. Scott, J. R. Taverner, H. B. D. Grazebrook, G. F. Harmer, T. Tatton, F. H. Jefferis, W. A. Haslam. The undermentioned to be 2nd Lieuts. (on prob.): Dec. 1st: R. G. Jardine, C. Dolphin, A. B. Campbell, G. H. S. Dinsmore, G. V. Walsh, H. E. Jones, J. W. Fleming, I. M. Maclean, D. A. McDougall, A. L. R. Dean, C. W. Alexander; Dec. 4th. Dec. 5th: P. J. Moloney, R. D. Clerk, F. S. Coghill, E. F. Crossland. Dec. 8th: E. W. Walford, P. W. Renshaw, A. Miller, R. H. Butler, S. L. Amor. R. A. Watson; Dec. 15th.

*London Gazette Supplement, December 28th.*

**Flight Commanders (from Flying Officers, and to be Temp. Capt. whilst so employed).** Dec. 1st: 2nd Lieut. (on prob.) J. I. MacKay, W. Rid. R., S.R.; 2nd Lieut. F. Sowrey, D.S.O., R. Fus.

**Flying Officers.**—2nd Lieut. A. Appleton, E. Lan. Brig., R.F.A. (T.F.); Nov. 15th. Temp. Lieut. R. L. Stevenson, A.S.C., and to be transferred to Gen. List; Nov. 16th. Temp. 2nd Lieut. (on prob.) J. W. Cairns, Gen. List; Dec. 2nd. Temp. 2nd Lieut. F. A. W. Handley, R.E.; Dec. 5th. Dec. 6th: 2nd Lieut. (Temp. Lieut.) P. W. Battersby, W. Som. Yeo. (T.F.); 2nd Lieut. (Temp. Lieut.) G. J. Hatch, Lond. R. (T.F.); Temp. 2nd Lieut. (on prob.) H. S. Tighe, attd. E. Surr. R.; Temp. 2nd Lieut. H. A. B. Norris, Gen. List; 2nd Lieut. D. N. Robertson, S.R. Temp. 2nd Lieut. E. H. Comber-Taylor, Gen. List; Dec. 7th. Dec. 8th: Lieut. R. Lund, R. Berks. R. (T.F.); Lieut. V. H. Huston, Canadian A.S.C.; Lieut. L. M. S. Essell, E. Kent. R., and to be sec'd.; Lieut. H. A. E. Matthews, Dorset R., and to be



secd. Dec. 9th: Temp. 2nd Lieut. W. C. Marsh, attd. R. Berks. R.; Temp. 2nd Lieut. L. A. Hardwick-Terry, R.E.; 2nd Lieut. L. L. Carter, S.R.; Temp. Lieut. R. E. Johnson, Som. L.I., and to be transferred to Gen. List. Dec. 10th: 2nd Lieut. G. E. Hawksley, R.F.A., S.R.; 2nd Lieut. (on prob.) E. H. Penberthy, Lond. R. (T.F.). Dec. 11th: Temp. 2nd Lieut. A. J. Gogarty, Gen. List; Capt. (Temp. Maj.) R. H. Howell, 15th Lrs., Ind. Army; Temp. Lieut. J. B. Jaques, M.C., Durh. L.I., and to be transferred to Gen. List.

**Park Commander.**—Qmr. and Hon. Lieut. (Temp. Capt.) J. H. Wilford, R.F.C., from an Equipment Officer, 1st Class; Oct. 10th.

**Equipment Officers, 1st Class.**—From the 2nd Class, and to be Temp. Cpts. whilst so employed. Nov. 1st: Qmr. and Hon. Lieut. L. Newman, City of Lond. Yeo. (T.F.); Temp. Lieut. E. J. Howard, Gen. List; 2nd Lieut. (Temp. Lieut.) K. D. Abercromby, S.R.; 2nd Class—Lieut. F. M. I. Watts, Worc. R., from the 3rd Class; Dec. 11th. Temp. 2nd Lieut. A. F. Biscoe, Gen. List, and to be Temp. Lieut. whilst so employed; Dec. 22nd.

**Memoranda.**—The undermentioned to be Temp. Lieuts. whilst serving with R.F.C.: Temp. 2nd Lieut. E. A. H. Viscet, Exmouth; June 1st. Dec. 1st: Temp. 2nd Lieut. R. F. Power; 2nd Lieut. M. A. A. Lillis, R. Ir. Regt.; Temp. 2nd Lieut. R. B. Wainwright, attd. 17th Lrs.; Temp. 2nd Lieut. G. N. Dennis, E. York. R.; 2nd Lieut. A. Jennings, R.H. and R.F.A.; 2nd Lieut. F. MacB. Paul, R. War. R.; Temp. 2nd Lieut. F. W. Deane, R. Ir. Rif.; 2nd Lieut. (on prob.) H. MacKenzie, R. Lanc. R., S.R.; 2nd Lieut. (on prob.) H. J. Gearing, High. L.I., S.R.; Temp. 2nd Lieut. L. S. Ward-Price, Res. R. of 2nd L. Gds.; 2nd Lieut. W. G. Helpman, K.E. Horse, S.R.; Temp. 2nd Lieut. J. D. Seal; Temp. 2nd Lieut. S. K. Muir, Temp. 2nd Lieut. W. L. Joseph; Temp. 2nd Lieut. D. W. Clappen, 2nd Lieut. W. E. G. Bryant, R. Fus.; Temp. 2nd Lieut. O. D. Norwood, Temp. 2nd Lieut. J. T. Collier, Temp. 2nd Lieut. G. A. F. Layton, Temp. 2nd Lieut. J. W. L. Birkbeck; Temp. 2nd Lieut. T. A. Cooch, attd. Worc. R.; Temp. 2nd Lieut. R. D. C. Blake, Cadet S. B. Martin, to be Temp. 2nd Lieut. (on prob.) for duty with R.F.C.; Dec. 14th.

**Supplementary to Regular Corps.**—W. H. Doré, from Lieut., 32nd Canadian Inf., to be Lieut.; Dec. 23rd. 2nd Lieut. J. G. Bulger is cashiered by sentence of a General Court-Martial. Nov. 19th. (Substituted for the notification in the *Gazette* of Dec. 15th under the heading of Royal Field Artillery.) The undermentioned 2nd Lieuts (on prob.) are confirmed in their rank: H. Hoad, L. L. Carter, F. W. Keddie, W. E. Jones. The undermentioned to be 2nd Lieuts. (on prob.). Dec. 8th: B. E. Harris, H. R. Mosenthal, W. A. Sievwright. Dec. 12th: J. H. F. Pilling, N. R. Norman, C. R. Needs, T. H. Barton, D. A. Jardine, J. L. Bradford, G. E. Creighton, J. P. Macdonald.

#### London Gazette, December 29th.

**The undermentioned to be Temp. 2nd Lieuts. (on prob.)**  
For duty with R.F.C. Nov. 28th: Sergt. W. G. Ivamy, from R.E.; Sergt. A. J. Packham, from R.E.; Corpl. R. C. Doughty, from R.E.; Corpl. H. H. Rickie, from R.E.; Corpl. E. C. Morris, from R.E. Dec. 2nd: Sergt. A. B. Coupal, from R.F.C.; Sergt. W. F. Macdonald, from R.F.C.; 2nd Cl. Air Mech. W. A. Winter, from R.F.C.

#### Temp. appointment made at the War Office.

**Staff Lieut.**—2nd Lieut. R. W. B. Billingham, R.F.C., S.R., from an Equipment Officer, 3rd Cl., vice Lieut. (Temp. Capt.) A. McAlister, R.E., S.R. Nov. 29th.

**Flight Commanders.**—From Flying Officers, and to be Temp. Cpts. whilst so employed; Dec. 11th. Temp. 2nd Lieut. R. M. Hill, M.C., Gen. List; Temp. 2nd Lieut. H. Meintjes, Gen. List; Lieut. A. FitzR. P. H. Somerset-Leeke, S.R.; Dec. 19th.

**Adjutant.**—Temp. Capt. (Temp. Maj.) A. R. Martin, from Adjnt., Hamps. Aircraft Parks (T.F.), vice Temp. Capt. F. A. Forde, Gen. List; Dec. 14th.

**Park Commander.**—Qmr. and Hon. Lieut. (Temp. Capt.) G. Laing, R.F.C., from an Equipment Officer, 1st Class; Nov. 1st.

**Equipment Officer, 3rd Class.**—Temp. 2nd Lieut. (on prob.) P. A. Rich, Gen. List; Oct. 17th.

**Supplementary to Regular Corps.**—2nd Lieut. (on prob.) the Hon. F. W. S. McLaren relinquishes his commission on account of ill-health; Dec. 30th.

#### London Gazette Supplement, January 1st.

**Flight Commanders.**—From Flying Officers, and to be Temp. Cpts. whilst so employed: 2nd Lieut. (on prob.) G. H. Bonnell, R.F.A., S.R.; Dec. 11th. 2nd Lieut. G. C. Bailey, S.R.; Dec. 17th. Lieut. (Temp. Capt.) A. J. L. Scott, Sussex Yeo. (T.F.) from a R.F.C. Staff Officer, 2nd Cl., and to retain his temp. rank whilst so employed; Dec. 18th, but with seniority from Feb. 1st, 1915.

**Flying Officers.**—2nd Lieut. C. W. Elliott, S.R., from an Equipment Officer, 3rd Cl.; Nov. 1st. Lieut. W. A. Bishop, Canadian Gen. List; Dec. 8th. Dec. 9th: Temp. Lieut. G. G. Campbell, R.A., and to be transferred to the Gen. List; Temp. 2nd Lieut. J. E. Hunt, Gen. List; Temp. 2nd Lieut. A. D. C. Browne, 11th R. Innis. Fus., and to be transferred to the Gen. List. Temp. 2nd Lieut. G. M. Hopkins, Gen. List; Dec. 10th. Dec. 11th: Lieut. R. Duncan, 32nd (Res.) Canadian Inf. Bn.; Temp. 2nd Lieut. W. A. L. Poundall, M.C., S. Lan. R.; Temp. 2nd Lieut. A. Morgan, Gen. List. Dec. 12th: 2nd Lieut. G. A. Exley, 5th Yorks. L.I. (T.F.), from a Flying Officer (Observer), with seniority from June 19th; Temp. 2nd Lieut. F. Beaumont, Gen. List, from a Flying Officer (Observer), with seniority from June 21st; Temp. 2nd Lieut. F. Adams, Gen. List; Temp. Lieut. McC. B. Watson, R.E.; Lieut. N. Sales, 3rd Yorks. L.I., S.R., from Machine Gun Corps, and to remain secd.; 2nd Lieut. M. Burbidge, R.F.A. (T.F.); 2nd Lieut. N. H. Colson, S.R. Dec. 13th: Temp. 2nd Lieut. (on prob.) G. Eastwood, Gen. List; 2nd Lieut. B. L. Blofeld, 5th R.W. Kent R. (T.F.). Dec. 14th: 2nd Lieut. E. M. Milling, S.R.; Temp. 2nd Lieut. E. P. Wilmot, Gen. List.

**Flying Officer (Observer).**—2nd Lieut. (Temp. Lieut.) J. W. Brown, R.A., and to be secd.; April 5th.

**Equipment Officers, 3rd Class.**—2nd Lieut. C. W. Elliott, S.R., from July 17th to Oct. 31st. Lieut. (Temp. Capt.) T. H. Vitty, Lond. Electrical Engrs., R.E. (T.F.); Oct. 1st. 2nd Lieut. E. I. David, S.R.; Nov. 1st. 2nd Lieut. W. G. Cleghorn, R.G.A. (T.F.); Nov. 11th.

**Memorandum.**—Sergt.-Major W. E. Smith, from R.F.C. to be Temp. 2nd Lieut. (on prob.) for duty with the military wing of that Corps; Dec. 13th.

**Supplementary to Regular Corps.**—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their ranks: N. H. Colson, E. I. David, E. M. Milling, C. W. Elliott.

#### Schools of Military Aeronautics.

##### London Gazette Supplement, December 21st.

**Chief Instructor** (graded as a Park Commander).—Temp. Maj. A. E. G. MacCallum, Gen. List from an Asst. Comdt. (R.F.C. Staff Officer, 2nd Cl.), vice Capt. C. M. Crowe, S.R.; Dec. 14th.

##### London Gazette Supplement, December 28th.

**Assistant Commandant** (Staff Officer, 2nd Class) (graded for purposes of pay as a Brig. Maj.).—Temp. Capt. F. A. Forde, Gen. List, from Adjnt., vice Temp. Maj. A. E. G. MacCallum, Gen. List; Dec. 14th.

**Chief Instructor** (graded as a Squadron Commander).—Capt. C. M. Crowe, S.R., from a Flight Comdr., from Nov. 1st to Dec. 13th.

#### Aeronautical Inspection Department.

##### London Gazette Supplement, December 21st.

E. J. Vallentine to be Temp. Hon. Lieut. (without Army pay or allowances) whilst employed as Asst. Insp., A.I. Dept.; Nov. 6th.

#### Royal Flying Corps (Territorial Force).

##### London Gazette, December 19th.

Flight Sergt. C. Fairbrother to be 2nd Lieut.; Dec. 18th. 2nd Cl. Air-Mechanic N. F. Stockbridge to be 2nd Lieut.; Dec. 18th.

##### London Gazette Supplement, December 28th.

C. A. Walker-Leigh (late Temp. Maj.) to be Capt. (Temp.) and Adjnt.; Dec. 29th.



#### A Fatal Accident.

SECOND LIEUTENANT J. E. TOWNSEND, R.F.C., was killed, and his observer severely injured, in a flying accident in Gloucestershire on January 2nd. The aeroplane when at a considerable height suddenly swerved and dropped nose downward to the ground, the machine appearing to side-slip when banking during a turn. Lieutenant Townsend was dead

when extricated from the wreckage; the observer was taken to hospital in a critical condition.

#### A Fatality in the Fog.

A VERDICT of accidental death was returned at an inquest on Air-Mechanic C. R. Whitton, R.N.A.S., whose body was found in the Thames near Chelsea Bridge. While walking to his home on December 27th he apparently mistook his way in the thick fog, and fell into the river.

## THE AERONAUTICAL SOCIETY OF GREAT BRITAIN AND THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS.

It is officially notified to us that an agreement likely to have far-reaching effects upon the development of aeronautics has lately been entered into between the Aeronautical Society of Great Britain and the Society of British Aircraft Constructors as the result of conferences between the two bodies.

The main objects of the agreement are to provide for the co-operation and mutual support of the two bodies in their respective spheres, to develop and co-ordinate aeronautical research and generally to link up the scientific and industrial aspects of aeronautics.

Under the agreement in question the Aeronautical Society of Great Britain is recognised as the paramount and representative body of the scientific and technological aspects of aeronautics, while the Society of British Aircraft Constructors is recognised as the paramount and representative body of the British aircraft industry. The Aircraft engine is covered by these provisions.

The arrangements which have been made provide for the setting up of a Standing Committee consisting of equal numbers of the members of the Council of the Aeronautical Society and of the members of the Committee of Management of the Society of British Aircraft Constructors. This Standing Committee will have power to invite representatives of Government Departments and other bodies to assist in its deliberations.

An important function of the Standing Committee will be to act as the channel of communication by which the governing bodies of the societies are to be kept in touch. It will advise the governing bodies upon matters affecting their common interests, will consider questions of policy, and will recommend to the respective governing bodies whether joint action is or is not desirable on any matter coming within the scope of the Standing Committee.

It is laid down that all questions relating to scientific and technological research arising from the mutual action of the two societies shall be dealt with by the Aeronautical Society, and similarly all industrial questions shall be dealt with by the Society of British Aircraft Constructors. A very important provision deals with the setting up of Technical Committees for special purposes. These are to be established by the Aeronautical Society on the recommendation of the Standing Committee, and will in all cases be composed of an equal number of representatives of each society. Like the Standing Committee, these special committees will have power to invite the assistance of representatives of other bodies, and Government Departments.

It will be seen that the foregoing arrangements provide for a Standing Committee to consider questions of policy generally, while the Technical Committees will investigate particular problems, concentrating upon them the special expert knowledge of all the interests concerned.



## THE ROLL OF HONOUR.

REPORTED by the Admiralty:—

### Accidentally Injured.

Flight Sub-Lieut. G. C. V. Hewson, R.N.  
Flight-Lieut. J. E. Minifie, R.N.

### Prisoner of War.

Lieut. F. H. Mitchell, R.N.V.R.

Reported by the War Office:—

### Previously reported Missing, now reported Killed.

2nd Lieut. G. Hedderwick, D.G., attd. R.F.C.  
2nd Lieut. F. M. Lawledge, R.E. and R.F.C.  
2nd Lieut. T. G. G. Sturrock, R. Scots, attd. R.F.C.  
Capt. C. R. Tidswell, Dragoons and R.F.C.  
2nd Lieut. J. C. Wilson, Black Watch and R.F.C.

### Previously reported Missing, now reported Died of Wounds as Prisoner of War in German hands.

2nd Lieut. H. Thompson, R.F.C.

### Accidentally Killed.

2nd Lieut. H. D. Pashley, R.F.C.

### Wounded.

Lieut. W. O. Boger, Can. Cav., attd. R.F.C.  
2nd Lieut. W. K. M. Britton, R. Munster Fus., attd. R.F.C.  
2nd Lieut. G. C. Gardener, R.F.C., attd. Mach. Gun. Corps.  
2nd Lieut. J. B. Jones, R.F.C.  
Lieut. W. B. Kellogg, R.F.C.

### Missing.

Lieut. W. M. V. Cotton, R.F.C.  
2nd Lieut. L. G. D'Arcy, Connaught Rangers, attd. R.F.C.  
Lieut. D. W. Davis, Can. Gen. List, attd. R.F.C.  
2nd Lieut. N. Fiske, R.F.C.  
Lieut. J. A. Hollis, East Yorkshire Regt., attd. R.F.C.  
Capt. A. G. Knight, R.F.C.  
Lieut. R. Smith, East Surrey Regt., attd. R.F.C.  
Lieut. C. H. Windrum, Royal West Kent Regt., attd. R.F.C.

### Previously reported Missing, now reported Prisoners of War in German hands.

Lieut. A. Anderson, Connaught Rangers and R.F.C.  
2nd Lieut. T. H. Clarke, Army Ordnance Dep., attd. R.F.C.  
2nd Lieut. L. C. L. Cook, A.S.C., attd. R.F.C.  
2nd Lieut. H. A. Hallam, York and Lancs., and R.F.C.  
Lieut. G. F. Knight, Devonshire and R.F.C.  
Capt. T. Mapplebeck, King's (Liverpool), attd. R.F.C.



### Sir Douglas Haig's Despatch.

In the despatch dated December 23rd, 1916, published as a supplement to the *London Gazette* on December 29th, describing the battle of the Somme, there are the following references to the work of the R.F.C.

Writing of the German trenches between the Somme and the Ancre, Sir Douglas Haig says:—

"The second system itself, in many places, could not be observed from the ground in our possession, while, except from the air, nothing could be seen of his more distant defences."

"On June 25th the Royal Flying Corps carried out a general attack on the enemy's observation balloons, destroying nine of them, and depriving the enemy for the time being of this form of observation."

"On the same day (September 26th) Gueudecourt was carried, after the protecting trench to the west had been captured in a somewhat interesting fashion. In the early morning a Tank started down the portion of the trench held by the enemy from the north-west, firing its machine guns and followed by bombers. The enemy could not escape, as we held the trench at the southern end. At the same time an aeroplane flew down the length of the trench, also firing a machine gun at the enemy holding it. These then waved white handkerchiefs in token of surrender, and when this was reported by the aeroplane the infantry accepted the surrender of this garrison. By 8.30 a.m. the whole trench had been cleared, great numbers of the enemy had been killed, and eight

officers and 362 other ranks made prisoners. Our total casualties amounted to five."

"In this combination between infantry and artillery the Royal Flying Corps played a highly important part. The admirable work of this Corps has been a very satisfactory feature of the battle. Under the conditions of modern war the duties of the Air Service are many and varied. They include the regulation and control of artillery fire by indicating targets and observing and reporting the results of rounds; the taking of photographs of enemy trenches, strong points, battery positions, and of the effect of bombardments; and the observation of the movements of the enemy behind his lines."

"The greatest skill and daring has been shown in the performance of all these duties, as well as in bombing expeditions. Our Air Service has also co-operated with our infantry in their assaults, signalling the position of our attacking troops, and turning machine-guns on to the enemy infantry and even on to his batteries in action."

Not only has the work of the Royal Flying Corps to be carried out in all weathers and under constant fire from the ground, but fighting in the air has now become a normal procedure, in order to maintain the mastery over the enemy's Air Service. In these fights the greatest skill and determination have been shown, and great success has attended the efforts of the Royal Flying Corps. I desire to point out, however, that the maintenance of mastery in the air, which is essential, entails a constant and liberal supply of the most up-to-date machines, without which even the most skilful pilots cannot succeed."



# AIRCRAFT WORK AT THE FRONT.

## OFFICIAL INFORMATION.

### British.

*General Headquarters, December 22nd.*

"Yesterday during the few bright intervals our aeroplanes co-operated successfully with our artillery. One of our machines has not returned."

*War Office, December 23rd.*

"*Mesopotamia.*—On the morning of Dec. 21st, British aeroplanes dropped nearly a ton of explosives on the Turkish advanced base and shipping near Baghailah (25 miles west of Kut-el-Amara). On the same day hostile trenches on the south bank of the Tigris, near Kut-el-Amara, and on the north bank at Sanna-i-yat, were subjected to a heavy artillery bombardment. Aeroplane observers reported that both bombardments were very effective.

"At dawn on Dec. 22nd a second aeroplane raid on the Turkish base near Baghailah was successfully carried out."

*War Office, December 24th.*

"*Salonica.*—On our Doiran front our aircraft carried out a successful bombing attack on Xanthi Station and enemy transport collected there. One enemy aeroplane was destroyed and a second driven down by our aeroplanes.

"*Egypt.*—On Dec. 22nd our aircraft carried out several successful raids in the El Arish region. At Maghdaba about a ton of high explosives was dropped on the enemy concentration, causing many casualties to personnel. Attacks were made on Beersheba and Auja, and an important railway bridge over a deep ravine at Tel-el-Sharia, 15 miles north of Beersheba, was seriously damaged. All our machines returned safely.

"On the afternoon of Dec. 23rd our mounted troops carried a strong enemy position at Maghdaba (20 miles south-south-east of El Arish), after an engagement which commenced at 9 a.m. Five hundred prisoners were taken. Aircraft co-operated in the attack both with bombs and with machine-gun fire from a low altitude."

*War Office, December 25th.*

"*Egypt.*—Our aeroplanes are continuing to harass the enemy."

*General Headquarters, December 27th.*

"Yesterday much successful work was performed by our airmen in co-operation with our artillery. A number of fights took place in the air, in the course of which one hostile machine was destroyed and five others were forced to land in a damaged condition. Three of our machines are missing."

*Admiralty, December 28th.*

"On the 26th inst. a squadron of naval aeroplanes bombarded enemy camps at Galata, Gallipoli, with successful results.

"On the 27th inst. a squadron of naval seaplanes attacked and destroyed Chikaldir Bridge, 18 miles east of Adana."

*General Headquarters, December 28th.*

"A number of fights took place in the air yesterday. Three hostile machines were destroyed and three others were driven down in a damaged condition."

*General Headquarters, December 29th.*

"In spite of adverse weather conditions, some successful work was carried out yesterday by our aeroplanes, in conjunction with our artillery. One of our machines has not returned."

### French.

*Paris, December 25th.*

"On the Somme front three German aviators were brought down by our pilots yesterday. The first enemy machine fell in flames south of Epenancourt, the second crashed to the ground near Ommiecourt, and the third near Liancourt. Last night one of our air squadrons bombarded the enemy aviation ground at Vraignes as well as the ammunition depôts at Athies-en-Nemain and Mons-en-Chaussée."

*Paris, December 26th.*

"Yesterday 10 of our machines bombarded the railway station and hutments of Nesle and bivouacs in the woods of Chapitre and Ourscamps."

*Paris, December 27th.*

"It is now confirmed that Lieutenant Heurteaux brought down his fourteenth enemy machine at 11.30 a.m. on Dec. 24th between Chaumes and Hyencourt-le-Grand."

*Paris, December 28th.*

"It is confirmed that on Dec. 26th Lieut. Heurteaux brought down his fifteenth aeroplane over Vaux Wood. On the same day Sub-Lieut. Guynemer brought down his twenty-fourth machine east of Misery and his twenty-fifth on Dec. 27th 300 metres south of La Maisonnette. Another German aeroplane came crashing to the ground after a fight with one of our pilots in the neighbourhood of Ommiecourt.

"At 2 o'clock yesterday afternoon 13 machines of the British Naval Aviation Service bombarded the blast furnaces

at Dillingen; 1,100 kilogrammes (over a ton) of projectiles were dropped.

"Our Aviation Service carried out various bombardments in the course of yesterday and last night. The railway stations of Montmedy and Pierrepont (east of Longuyon) received many projectiles; 720 kilogrammes (13 cwt.) of shells were also dropped on the factories at Thionville and Joeuf (Briey coalfield), 90 120 mm. shells on the blast furnaces at Rombach, and 60 on the blast furnaces at Hagondange. Two of our dirigibles bombarded one of the factories at Hagondange and the other the ironworks at Neunkirchen."

*Paris, December 29th.*

"Lieut. Heurteaux, on the 27th, brought down his sixteenth enemy machine at 11.55 a.m., over Mangues Wood (south-east of Misery). It is confirmed that during the same day our pilots brought down four other enemy machines. One of these was beaten down by Lieut. Loste, who thus brought up his total victories to six; and by Private Martin, who up to that day had brought down five machines.

"Two of the aeroplanes destroyed during the 27th, the destruction of which was announced in to-day's afternoon *communiqué*, were brought down, one by Adjutant Lusbery, the other by Lieut. de la Tour. Adjutant Lusbery has so far brought down six enemy machines, and Lieut. de la Tour eight. During the 27th and the following night our bombarding aircraft dropped bombs on the aviation ground at Griselles, on the railway station of Nesle, and on different munition works, including those at Neunkirchen."

### Russian.

*Petrograd, December 22nd.*

"About 3 p.m. yesterday our aviator, Capt. Kozakoff, brought down an Austrian aeroplane which appeared over Lutsck. The pilot, a non-commissioned officer, was killed and the officer observer injured and made prisoner. The machine was smashed."

*Petrograd, December 24th.*

"Some enemy aeroplanes dropped bombs in the region of Perichul and Braila. In the region of the Yanka railway station on the Buzen-Braila line a German aeroplane landed, and the officer and two soldiers were made prisoners."

*Petrograd, December 28th.*

"*Western Front.*—Our battery fired at an enemy aeroplane, which descended in the region of Ocna. The pilot and observer were taken prisoners."

*Petrograd, December 31st.*

"On Dec. 27th an aerial combat took place in this region. Our aviator, Ensign Petrajitski, and the observer, Ensign Bartosh, on a Voisin machine, engaged in battle two enemy aeroplanes. One of the enemy machines fell in the Slanicu Valley. The aviators were taken prisoners."

### Italian.

*Rome, December 22nd.*

"One of our seaplane sections to-day dropped bombs on military establishments at Pola and on warships anchored in the port. Despite a sharp fire from the anti-aircraft defences and an attempted attack by enemy aeroplanes, our seaplanes returned to their base unharmed.

"Hostile aircraft attempted raids over our lines, but were promptly driven off by the fire of our anti-aircraft batteries. A few bombs were dropped on Grigno (Sugana Valley), Calalzo (Oten Valley), Piave and Vertoiba (south-east of Gorizia), without causing casualties or damage."

*Rome, December 29th.*

"Hostile aircraft dropped bombs on Ala (Lagarina Valley) and on Tezze (Sugana Valley). No victims or damage are reported, and the aeroplanes were driven back everywhere."

*Rome, January 2nd.*

"Hostile aircraft attempted raids on the Sette Comuni plateau, on the Sugana Valley, and on the Carso. One enemy machine was brought down behind the enemy's lines by the fire of our anti-aircraft batteries."

### German.

*Berlin, December 27th.*

"*Western Theatre.*—In aerial fighting the enemy sustained the loss of nine aeroplanes.

"*The Dobruja.*—Both airships and aerial squadrons operated with success in the rear of the enemy against important railways and port establishments."

*Berlin, December 28th.*

"*Western Front.*—The activity of the aerial fighting forces was very lively. The enemy lost eight aeroplanes in aerial engagements, and through the fire of our anti-aircraft guns."

*Berlin, January 2nd.*

"An English super-aeroplane fell into our hands."

## Bulgarian.

"In the valley of the Vardar there was ineffective aeroplane activity by the enemy."

Sofia, December 28th.

Sofia, December 30th.

"In the region of Monastir there has been lively aerial activity. An enemy aeroplane was brought down east of

Monastir. On the Struma there has been ineffective activity by enemy aeroplanes."

## Turkish.

Constantinople, December 21st.

"Tigris Front.—One of our aeroplanes forced an enemy aeroplane to come down near the enemy's lines."



## Air Fighting in December.

The following interesting summary of the air fighting in December has been compiled by the *Times* :—

"Owing, no doubt, to the suspension of fighting on a large scale, and also to the recent bad weather, the number of aeroplanes destroyed or driven down in a more or less damaged condition on the Western battle front was smaller in December than in any previous month since June. In that month 72 British French, and German machines fell into one or other of these categories. For July the number was 165; August, 189; September, 322; October, 171; November, 112. Last month the number, according to the daily *communiqués* from British General Headquarters, the French Ministry of War, and German Main Headquarters, was 94.

"Of these 10 were British—admitted by General Headquarters; 63 were German; 21 were, if the enemy claims are trustworthy, French. There are no means of checking the German claims, because in the first place they are again, as in November, made in the most general terms, no date or place being named in the official reports, and, next, because the French Ministry of War does not, like our General Headquarters, acknowledge losses in its Air Service.

"The 63 German machines fell—35 to British airmen and 28 to French. Nine of the 35 were destroyed, one came down in our lines, four were driven down out of control and almost certainly wrecked, nine were driven down in a damaged condition, and 12 made forced landings. Practically all the 63 fell in aerial fighting, and it is a fair assumption from the particulars furnished in the French *communiqués* that a large proportion of the 28 conquered by French airmen were destroyed. The German victories were won partly in air fights and partly by anti-aircraft gunfire, but there is no indication of the respective proportions.

"Two of the machines included in the total of 94—one French and one German—were lost as the result of a collision during a fight."

## 1914 and 1916.

In an article in the *Daily Telegraph* contrasting the war conditions to-day with those of two years ago, Mr. Boyd Cable says :—

"And finally, leaving the best to the last, look at the air service we have to-day. Only the infantry know how much they owe the guns; only the guns know how much they owe the airmen. In old times (for so we now speak of less than two years ago) the guns that were not most carefully concealed were practically doomed to destruction, the infantry that dared walk above ground in daylight within range of the enemy artillery was deliberately 'asking for it'—and rarely failed to get it. But now the artillery barely troubles about concealment, the infantry, the transport, the supply columns brazenly tramp or sit down and camp by thousands well within artillery range. They trust the airmen to keep off the piercing eyes that might betray their whereabouts to the destroying gunners, and seldom is their trust misplaced. A raiding German airman over our lines is not seen for weeks on end. The sky is never empty of ours, patrolling to and fro, casting in wide sweeps over the enemy ground, picking up gun positions, taking photos, mapping out the enemy trenches, coming and going—single, flimsy shapes against the sky, or flocks of anything up to a score. They are so many and so daring that now the enemy 'Archies,' or anti-aircraft guns, are chary even of trying to shell them, because if only they shell long enough one or other of the wheeling shapes will 'spot' their flashes, dot down their position on the map, talk for a little with the wireless to their friends the gunners, and then wait, circling round, to watch the wrath to come visit those German 'Archies.'

"It is a vastly different story when one of their airmen dares fly within range of our anti-aircraft guns. Our gunners, 'bored stiff,' they will tell you, with looking through a telescope all day and seeing nothing, are aching for their chance, and as the raider comes into long range the puffing shrapnel bursts begin to pattern the sky about him. Usually he turns promptly for home again; if he carries on, he first slants steeply upwards, climbs and climbs until he is a mere speck in the sky, or is lost to naked-eye vision, and so sees nothing, or so little that it is not worth seeing, and decidedly not worth the risk. For there is risk a-plenty for him, no matter how fast or high he flies. He may outclimb the 'Archies,'

shells, but he cannot outclimb our airmen, and they, once they see their quarry a-wing, are at and after him like hawks on a heron.

"Two years ago, short of men, of munitions, of all the weapons of modern war, we held our own, and our line stood against the greatest weights that Germany could hurl against it. Now we are beginning to show what, on fair terms, we can do. The Navy has never lost its full command of the seas, our flying men have regained their command of the air; and now, on the shell-battered battle-fields, the Army is proving week by week (and setting on the proof the seal of captured prisoners, guns, and ground) the last link of the chain of victory. It may be this year, it may not be for yet another, but the end must be victory to the Allies, victory complete and absolute out and out—earth, air, and sea.

## Air Work in Mesopotamia.

In his despatch from the Tigris front, dated December 17th, Mr. Edmund Candler gives the following details of R.F.C. work in Mesopotamia :—

"On the night of the 14th-15th our aeroplanes flew over Kut by moonlight and dropped bombs on the enemy's bridge as it was being towed upstream in sections. Pontoons were cast adrift and scattered, and during the next day the Turks were unable to transport troops across the river except by ferrying. Throughout the operations our Flying Corps have put in excellent work in reconnaissance and gun-marking, and have engaged and driven back hostile aeroplanes. One of our machines, hit by a bullet, which broke a strut, descended between our cavalry and Shumran bridgehead, and was shelled by the guns. It had just been engaged in observing. The aviators escaped unhurt, and the machine was brought in without injury."

Writing on December 26th, he says :—

"The Flying Corps have been putting in good work. On December 21st nine machines carried out a bombing raid on Bagheila—a Turkish supply centre 20 miles upstream from Kut. All the machines returned undamaged after dropping a ton of bombs on shipping and dumps. On the 20th one of our airmen engaged a hostile Albatros over Kut, killed the observer, wounded the pilot, and brought the machine down with a crash. During the fight his engine was badly holed by rifle fire from the trenches, but he glided home safely behind our lines. He was decorated with the Military Cross by General Maude this morning.

"On the morning of the 24th a captain was decorated with the D.S.O. for a daring night flight. He found a Turkish gunboat towing a pontoon bridge up-stream in sections from Shumran. He bombed her from a very low altitude, caused her to run aground and slip her tow. He returned to the aerodrome for more bombs and again drove her into the bank and scattered the pontoon. He then returned a second time to the camp for bombs and repeated the performance. The three journeys kept him in the air from midnight to 6 a.m.

"Yesterday our aeroplanes bombed a hostile column marching towards Baghailah. Throughout the recent fighting aeroplane co-operation has rendered invaluable assistance to the cavalry."

## German Aircraft Activity in the Balkans.

THE *Times* correspondent with the Serbian Army, writing on Dec. 21st, says :—

"Moreover, the Germans are striving hard to regain the ascendancy in the air, which they had so completely lost from the beginning of September to the end of November. They have increased the number of their aircraft by the addition of several aeroplanes of the newest types, each carrying two machine guns, and now once more they are crossing our lines with comparative impunity.

"Four days ago one of these machines dropped a bomb close to a British lorry loading stuff for the Serbians by the roadside. The explosion only slightly damaged the lorry, but killed three of our Bulgarian prisoners who were engaged in loading it. The British driver and his assistant were uninjured."

## Another Raid on Zeebrugge.

THE *Telegraaf* reports from the frontier that between half-past eleven and noon on the 27th an air attack was made on Zeebrugge. The aeroplanes were fired at from Knocke, Heyst, and Zeebrugge.



[illegible]

It is of interest to note that last month the Aktiebolaget Svenska Kullagerfabriken, of Sweden, the parent company of the Skefko Ball-Bearing Co., Ltd., attained its tenth birthday. We are informed that in 1906 the staff, including commercial, manufacturing and technical departments, numbered 15 all told, and at the present time this company has extended its branches to practically every large city throughout the civilised world, employing approximately 9,000 people. By this, one is able to form some idea of the company's growth. Curiously, Mr. Sven Wingquist, the inventor of the Skefko Double Row Self-Aligning Bearing and the founder of the Aktiebolaget Svenska Kullagerfabriken, of Sweden, attains his fortieth year on the 10th of last month.

In business probably no firm gives more serious attention to the special requirements of their customers than Messrs. Brown Brothers, of Great Eastern Street. But they are evidently believers in the saying that it's a sad heart that never rejoices, if one is to judge by the very amusing wall calendar to hand from them for 1917. Two months go to the page, whilst the better part of the 12 by 9 ins. of the space available is taken up by a series of pictures in colour from the brush of Lawson Wood upon the "Trials of a Sportsman." Each of the six studies has a dry humour of its own, which puts you in a good temper with yourself, and with Messrs. Brown Brothers, whose happy inspiration is the cause.

THANKS are extended to General Motors, Ltd., for a very striking daily tear-off calendar, which is eminently suited for a prominent position as the figures are bold. More suitable for hanging near the desk is an artistic monthly tear-off calendar to hand from the British Aluminium Co., the picture being a charming photogravure of the Dam at Kinlochleven.

## FROM THE BRITISH FLYING GROUNDS.

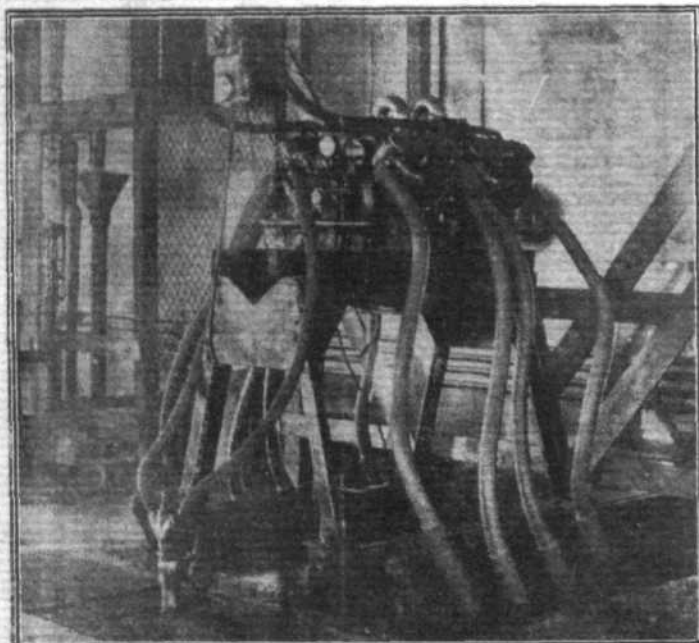
Grahame-White School, Hendon.

CIRCUITS with instructor last week: Messrs. Brocklehurst, Ellis, Glynn, Scott and Shaver. Circuits alone: Mr. Flynn. Instructors: Messrs. Winter, Pashley, Biard, Hale, Fitzsimons and Meering.

## PUBLICATIONS RECEIVED.

The "Wellcome" Photographic Exposure Record and Diary, 1917. London: Burroughs Wellcome and Co., Snow Hill Buildings, E.C. Price 1s.; post free 1s. 1d.

The Flying Machine from an Engineering Standpoint. By F. W. Lanchester. London: Constable and Co., Ltd. Price 4s. 6d. net.



The steady running of the Sturtevant aeroplane motor is well exemplified by the above photograph, which was taken with a time exposure when the engine was running at 2,000 revs. per min. Yet in the original photograph, as will be noticed, every part is sharply defined.

## COMPANY MATTERS.

### D. Napier and Son, Ltd.

THE directors' report and balance sheet, as at September 30th, 1916, show a profit, after allowing for depreciation of premises, plant and tools, of £76,856 5s. 6d., to which is added the balance brought forward from last account £9,839 7s. 1d., making a total of £86,695 12s. 7d. Deduct dividend for the year on preference shares to June 30th, 1916, and interest on Debenture Stock to September 30th, 1916, £28,000; income tax, £5,203 12s. 2d.; directors and trustees fees, £605; commissions and bonuses to managers, £2,329 13s. 10d.; total, £36,138 6s., leaving a balance of £50,557 6s. 7d., which the directors recommend shall be appropriated as follows:—Pay a dividend of 6 per cent. less income tax on the ordinary shares amounting to £21,000; place to general reserve a further £20,000 (total £41,000); carry forward to next year a balance of £9,557 6s. 7d. The Company has during the past year continued to supply practically its entire output to the British and Allied Governments, and has remained a Controlled Establishment under the Munitions of War Act, 1915. The demand for increased output has necessitated a further outlay on plant, machinery and buildings, and will continue to do so during the current year.

### NEW COMPANIES REGISTERED.

EBORA PROPELLER CO., LTD.—Capital £4,000, in £1 shares. To carry on the business of manufacturers of propellers and other parts of and accessories to aeroplanes, airships and aircraft, flying machines. Directors, Jan Schiere, S. Cole and F. B. Darocle.

HIGHGATE AIRCRAFT CO., LTD.—Capital £10,000, in £1 shares. Acquiring business carried on at Highgate, N., as the Highgate Aircraft Co. T. Antoine, 82, Church Street, Chelsea, S.W., aeronautical engineer, 1 share; C. Humphries, 36, Basinghall Street, E.C., solicitor, 1 share. First directors: F. W. Thorne, C. Humphries, T. Antoine and A. Halliday.

RUFFY, ARNELL AND BAUMANN AVIATION CO., LTD.—Capital £50,000, in £1 shares. Instructors, teachers, exhibitors of aviation, parcel and message carrying, &c., manufacturers of and dealers in aeroplanes, nautical and flying machines, airships, &c. Directors, F. Ruffy and R. S. Arnell.

## Aeronautical Patents Published.

### Applied for in 1915.

Published December 28th, 1916.

- 16,042. F. H. PAGE. Aircraft.  
17,139. F. SAGE AND CO. AND E. C. G. ENGLAND. Means for use on aeroplanes, &c.  
15,786. CURTISS MOTOR CO. Flying boats.

### Applied for in 1916.

The numbers in brackets are those under which the specification will be printed and abridged, &c.

Published December 21st, 1916.

- 6,358. H. G. BILLI. Aeroplanes. (102,321.)  
9,040. M. ANDREINI. Alighting signal apparatus for aeroplanes, &c. (101,283.)

Published December 28th, 1916.

- 2,815. S. DIGGLE AND J. P. CARTER. Propellers and tractors for use in aerial propulsion. (102,412.)  
11,626. V. J. CONCES. Flying machines. (101,789.)

Published January 4th, 1917.

- 2,557. E. E. SMITH. Parachutes. (102,544.)  
4,520. A. A. D. LANG. Jig for drilling bosses of aeroplane propellers. (102,557.)

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